The World's Commercial Products

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THE WORLD'S COMMERCIAL PRODUCTS.

PITMAN'S COMMERCIAL SERIES.

The World's Commercial Products

WITH

FRENCH, GERMAN, AND SPANISH EQUIVALENTS FOR THE NAMES OF THE COMMERCIAL PRODUCTS.

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BY

J. A. SLATER, B.A., LL.B. (LOND.)

of the Middle Temple and North-Eastern Circuit, Barrister-at-Law, (Author of "The Commercial Law of England," and "Pitman's Business Man's Guide.")

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LONDON:
Sir Isaac Pitman & Sons, Ltd., 1 Amen Corner, E.C.
And at BATH and NEW YORK.

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PRINTED BY SIR ISAAC PITMAN & SONS, LTD., BATH.
(1775)

PREFACE.

THE object of the present volume is to give a list of the chief commercial products and manufactures of the world, together with a short description of each of them, and the names of the countries or districts from which they are obtained. Full particulars upon these matters can only be gained by consulting either special books or works of an Encyclopædic nature; but it is believed that the present book may be useful as a handy work of reference in connection with the teaching of commercial subjects, and especially Commercial Geography, since the ordinary text-books on that subject, when dealing with the products of a country, do not go beyond an enumeration of these various products, and leave the student absolutely ignorant of their nature or kind. The addition of French, German, and Spanish equivalents will, it is believed, render the volume of additional use to those who are preparing for a commercial career.

THE WORLD'S COMMERCIAL PRODUCTS.

Abaca. (Fr. *Abaca*, Ger. *Abaka, Manillahanf*, Sp. *Abaca.*)

A species of banana, which yields Manilla Hemp. A woody fibre is obtained from the leaf stalks of the plant by splitting them into long strips, and these strips are then beaten with clubs, washed, and dried. The coarser fibres are used for the manufacture of cordage, and the finer for the production of the most delicate Indian muslins. The abaca is a native of the Philippine Islands, and the Manilla Hemp is their most considerable export, the annual value being more than £2,000,000.

Abietine. (Fr. *Huile de pin*, Ger. *Terpentinöl*, Sp. *Abietino.*)

A resinous substance—a hydrocarbon—the product of distillation obtained from the *pinus sabiniana*, a Californian tree. It is useful for the removal of grease spots, and as a substitute for petroleum benzine.

Absinthe. (Fr. *Absinthe*, Ger. *Wermuth*, Sp. *Ajenjo.*)

A spirit produced by steeping the leaves and flowering tops of certain species of *artemisia*, chiefly wormwood, and other aromatics in alcohol, and subsequent distillation. The product is a greenish coloured liquid. At first used as a medicine in cases of fever, absinthe has become a common beverage on the Continent. Its effects, when taken in any quantity, are extremely deleterious, and the danger arising from its use is largely increased by the common practice of adulteration, blue vitriol being sometimes found in so-called absinthe. It is manufactured principally at Couvet, in Switzerland, and at Pontarlier, in France. Of late years there has been a large export trade in this article from France to the United States.

Acajou. (Fr. *Acajou*, Ger. *Acajou, Mahagoni*, Sp. *Anacardo.*)

The French name for mahogany, though the name is really applicable only to the fragrant wood of the *cedrela Brasiliensis*. It is exported from Brazil in logs of sixteen to eighteen feet in length. From the nut of the acajou an essential oil is obtained, which is sometimes used in medicine.

Acetal. (Fr. *Acetale*, Ger. *Acetal*, Sp. *Acetal.*)

A colourless liquid with a pleasant odour, and a flavour resembling that of the hazel nut. It is produced by the slow oxidation of alcohol under the influence of dilute sulphuric acid and peroxide of manganese. Its chemical symbol is $C_2H_4(OC_2H_5)_2$. Specific gravity ·821; boiling point 105° C. It is a valuable reagent in organic chemistry.

Acetic Acid. (Fr. *Acide acetique*, Ger. *Essigsäure*, Sp. *Acido acético.*)

The principal ingredient of common vinegar when diluted with water. Pure acetic acid, which is a crystalline solid at ordinary temperature, is obtained by distilling dry acetate of potassium and sulphuric acid. Its chemical symbol is $C_2H_4O_2$. Specific gravity, 1·063; boiling point, 119° C. When applied to the skin it causes blisters to arise. It is sometimes used as a caustic. The salts of acetic acid, known as acetates, are important in the arts, the best known being the acetate or sugar of lead, and the acetate of copper, commonly known as verdigris.

Acetylene. (Fr. *Acétylène*, Ger. *Acetylene*, Sp. *Acetylene.*)

A colourless and rather heavy gas with an unpleasant odour. It is a powerful illuminant. Its manufacture for commercial purposes dates from 1895. It is made with the greatest ease by the decomposition of carbide of calcium by means of water. Acetylene gas is highly explosive, and great care is required in the use of it.

Aconite. (Fr. *Aconit*, Ger. *Eisenhut, Wolfswurz*, Sp. *Acónito.*)

A genus of plants of the order *ranunculaceae*. They are natives of Europe, Asia, and North America, but the woolly aconite, or monk's hood, is probably a native of Britain. All species have violent poisonous properties. In certain forms, however, a tincture of the root is used medicinally in cases of heart disease.

Aconitin. (Fr. *Aconitine*, Ger. *Aconitin*, Sp. *Aconitina.*)

An alkaloid contained in the leaves of the monk's hood. It is one of the most powerful poisons known. If applied to the skin it produces a tingling followed by numbness, and on that account it can be used with advantage to allay pains caused by neuralgia and rheumatism.

Aerated Waters. (Fr. *Eaux aérées*, Ger. *Mineralwasser*, Sp. *Aguas gaseosas.*)

Waters artificially impregnated with a large amount of carbonic acid gas, and other gaseous substances, used as beverages and medicines. The best known is soda water, a water which does not, however, contain any soda. Other varieties are seltzer, potass, lithia water, lemonade, ginger ale, etc.

Agar-agar. (Fr. *Agar-agar*, Ger. *Agar-agar*, Sp. *Agar-agar.*)

The name given to a gelatinous substance extracted from a species of seaweed abounding in the Eastern seas. It is prepared by boiling the sea-weed in water. In China and Japan agar-agar is much used as a food, and is sometimes known as Bengal or Japanese isinglass. It is also used for dressing various fabrics and paper, but the quantity imported into Europe is very small.

Agate. (Fr. *Agate*, Ger. *Agat, Agatstein*, Sp. *Agata.*)

A mineral composed of layers of quartz, closely compressed and of various colours. Silica enters largely into its composition, and it also contains a mixture of alumina and oxide of iron. It is capable of being very finely polished. and is much used in the manufacture of ornaments. It is found in considerable quantities in Scotland, Saxony, India, and Siberia. The agates found in Scotland are known as Scotch pebbles.

Agave. (Fr. *Agave*, Ger. *Agave, Baumaloe*, Sp. *Agave.*)

The name of a genus of plants, all natives of Central America, of the order *Amaryllidaceæ*. The best known species is the *Agave Americana*, commonly called the American Aloe. The agaves have short stems, crowded at the top with large leaves. Coarse fibres are obtained from the leaves, which are manufactured into thread, twine, rope, hammocks, etc. This fibre is sometimes called "pita flax." Latterly it has been introduced into the southern countries of Europe. The juice obtained from the leaves has been utilised as soap, and makes a lather in salt as well as in fresh water. The fermented juice is used by the Mexicans as an intoxicant under the name of "pulque."

Alabaster. (Fr. *Albâtre*, Ger. *Alabaster*, Sp. *Alabastro.*)

A mineral substance chiefly used for ornamentation. It is a variety of gypsum or selenite. It resembles marble in its general appearance, though it is softer than the latter mineral. When freed from foreign matter alabaster has a finely grained structure, is pure white or of a delicately tinted colour, and very transparent. The best alabaster is procured from Volterra in Tuscany. Other kinds are veined, striped, or spotted, and these are used for making statuettes and ornaments. A plentiful supply is obtained in Derbyshire. Since alabaster is somewhat soluble in water it is not suitable for external decoration, and as it is never found in large pieces, the work in it is limited to small articles.

Oriental alabaster is a stalactitic carbonate of calcium, a variety of marble. It is harder than ordinary alabaster and is obtained chiefly from Egypt.

Alcohol. (Fr. *Alcool*, Ger. *Alkohol*, Sp. *Alcohol.*)

A colourless liquid with a burning taste, and a slight but agreeable smell. It is the characteristic ingredient in all fermented drinks, giving them their intoxicating quality. Though occurring in nature in various plants, alcohol is practically derived from two sources only, viz., different kinds of sugar and starch. If these substances are plentifully mixed with water and then allowed to ferment with yeast, grape

sugar is produced, and this can be decomposed into alcohol and carbonic acid. From the dilute solution thus obtained alcohol can be partially separated by distillation, but as alcohol has a strong affinity for water, it is impossible to separate the two by distillation alone—the strongest *rectified* spirit thus obtained containing between nine and ten per cent. of water. To obtain pure or *absolute* alcohol the rectified spirit must be treated with quicklime and metallic sodium.

Pure alochol is inflammable and burns with a bluish flame. Its chemical symbol is C_2H_5OH. Specific gravity, ·809; boiling point, 78°C. As it has never been frozen, alcohol, coloured red by means of cochineal, is used for thermometers when it is necessary to register low temperatures. In the arts it is in great demand as a solvent of resins and fats, and in the preparation of varnishes. Owing to heavy duties, however, a mixture of alcohol and commercial wood naphtha, called methylated spirit, is very commonly employed.

Proof spirit is a mixture of alcohol and water in the proportion of 49·5 and 50·5. If the spirit is stronger than proof spirit it is said to be so many degrees over proof (O.P.), and if it is weaker than proof spirit, so many degrees under proof (U.P.). Proof spirit is very largely used in pharmacy in the preparation of various tinctures.

Alewife. (Fr. *Alose*, Ger. *Alse*, *Alose*, Sp. *Alosa.*)

Alosa tyrannus. A fish, closely resembling the shad, which is obtained in large quantities off the eastern coasts of North America. In the United States it is considered to be superior to the herring. There is a large trade in the export of this fish in a salted state from St. John's, New Brunswick, to the West Indies, the annual amount being about 20,000 barrels.

Alfa. (Fr. *Alfa*, Ger. *Alfa*, Sp. *Alfa.*)

Otherwise Halfa. One of the varieties of esparto, the stalks of which are extremely valuable for paper making. It grows in Algiers, Tunis, and Spain, though the first named country supplies the greatest quantity and exports it largely to England. (See *Esparto*).

Algaroba. (Fr. *Algarobie*, Ger. *Algaroba*, Sp. *Algaroba.*)

This is the Spanish name for the sweet pods of the *prosopis dulcis.* The pods are used for feeding cattle in Mexico, and also for purposes of tanning. The *algaroba glandulosa* of Arkansas provides a gum, by an incision made in its bark, which in many respects resembles gum arabic.

Alizarine. (Fr. *Alisarine*, Ger. *Alizarin*, Sp. *Alizarino.*)

The colouring matter used in the dyeing of Turkey red. It was originally found in the madder root, but it is now chiefly obtained from anthracene. The latter industry has developed so rapidly within the last thirty years that the cultivation of the madder root in Europe has been practically destroyed. The production of alizarine is almost a German monopoly. The value of this article annually imported into England exceeds £500,000. Its chemical symbol is $C_{14}H_6O_2$ $(OH)_2$.

Alkanet. (Fr. *Orcanète*, Ger. *Alkanna*, Sp. *Bugula.*)

The name of the root of the *Alkana tinctoria*, cultivated in various parts of southern Europe, and the Levant. From this root a beautiful reddish brown colour is obtained which is soluble in oils, turpentine, and spirit, and is very generally used by perfumers for colouring oils, soaps, pomades, etc. and in the composition of stains and varnishes. Great Britain imports nearly fifteen tons of alkanet every year.

Alligator Skins. (Fr. *Peaux d'alligator*, Ger. *Alligatorfelle*, Sp. *Piel de aligador.*)

The hide of the Mississipi alligator, now largely used in America and Europe for saddlery and leather goods. As the alligator does not perspire, the skin is not perforated with holes like the skins of land animals. The trade has grown up within the last forty years. It is only the skins of young alligators that can be easily utilised, as those of the older ones are too hard and horny to be of much value in manufacture.

Alloys. (Fr. *Alliages*, Ger. *Alliage*, Sp. *Ligas.*)

The bodies resulting from the union of two or more metals, a union brought about almost invariably under the influence of a high temperature. The sole exception is presented by mercury,

which attacks other metals when cold, and unites with them so as to form amalgams.

Metallic alloys have properties of their own which do not depend so much upon the metals of which they are composed, as upon the proportions in which the metals are mixed. In many cases it is possible for an alloy to be worked much more easily than pure metal, and in others pure metal cannot be used at all unless it is somewhat changed by the addition of another constituent. Gold and silver are good instances. They are neither of them hard enough for use as coins until a small quantity of copper has been added to them.

The principal alloys, with their percentage compositions, are :—

Bronze	Copper	95	Tin	5
Gun-metal	,,	90	,,	10
Bell-metal	,,	78	,,	22
Speculum-metal	,,	66	,,	34
Brass	,,	64	Zinc	36
Aluminium-bronze	,,	90	Aluminium	10
German silver	,,	51	Zinc 30·6 Nickel 18·4	
Pewter	Tin	80	Lead	20
Type-metal	,,	25	,,	50
			Antimony,	25

Britannia-metal, equal proportions of brass, tin, antimony, and bismuth.

Allspice. (Fr. *Piment, Tout épice,* Ger. *Englisch Piment, Pfeffer,* Sp. *Pimienta.*)

The name commonly given to the dried fruit of the *eugenia pimenta,* or *eugenia acris.* It is also known as Jamaica pepper and pimento, and is obtained from the West Indies. The name allspice is given to this substance because it possesses the combined flavour of several kinds of spices, especially cinnamon, nutmegs, and cloves. Several thousand tons are imported annually into Great Britain.

Almond. (Fr. *Amande,* Ger. *Mandel,* Sp. *Almendra.*)

A genus of the natural order *Rosaceae.* The almond tree (*amygdalus communis*) is very similar to the peach. It is a native of Africa, but is now widely distributed. The wood of the tree is hard and of a reddish colour, and is much in request by cabinet makers. But the almond tree is chiefly valuable on account of the kernel of its fruit. There are two kinds of almonds—bitter and sweet. The former is the original kind, the sweet being an accidental variety, perpetuated and improved by cultivation. The chief kinds of sweet almonds are the Valencia, the Italian, and the Jordan. The imports into Great Britain exceed 500 tons per annum. They are used medicinally as well as for dessert. Bitter almonds are imported from Mogadore to the extent of 300 tons per annum. They are valuable for the essential oil contained in them (the oil being obtained by distillation), and also for flavouring purposes. Great care is required in the use of bitter almonds, owing to the poisoning properties which they possess. These properties are very similar to those of prussic acid.

Almonds, Essential or Volatile Oil of. (Fr. *Huile volatile d'amandes amères, Essence d'amandes amères,* Ger. *Bitteres Mandelöl,* Sp. *Aceite amargo de almendras.*)

The amygdalin contained in bitter almonds acting upon another constituent, emulsin or synaptase, causes the formation of the essential or volatile oil of almonds. The oil is obtained from bitter almonds, when the cake from which the fixed oil has been extracted is steeped in water and submitted to distillation. The essential oil then forms and comes over, and consists of a mixture of several substances, especially hydrocyanic acid and benzoic acid. In commerce it is a golden-yellow liquid of an agreeable smell, but bitter taste, and is extremely poisonous. It is used by perfumers for scenting soaps, and also for flavouring purposes in cookery and confectionery, when the prussic acid element has been removed from it. The oil can also be extracted in large quantities from peach and apricot kernels, and there is a large trade in this business carried on at Damascus. The chemical symbol of the essential oil is C_5H_6COH.

Almonds, Fixed Oil of. (Fr. *Huile d'amandes,* Ger. *Süsses Mandelöl,* Sp. *Aceite de almendras.*)

The oil obtained from either bitter or sweet almonds when they are subjected to pressure. One hundredweight of almonds will produce about

50 lbs. of fixed oil. At first the oil extracted is of a milky appearance, but it quickly becomes of a yellowish colour, and turns rancid after a short exposure to the air. Its specific gravity is ·92, and it becomes solid at —20° C. It is composed almost entirely of a mixture of glycerine and oleic acid, called triolein. It is useful in pharmacy, and forms a good substitute for olive oil.

Aloe. (Fr. *Aloès*, Ger. *Aloe*, Sp. *Aloe.*)

A plant of which there are nearly two hundred species, most of them being natives of South Africa, but now widely spread. The fibres of the leaves, being stronger than hemp, are used for cords and nets by the negroes of West Africa, and in Jamaica one species is used for making stockings. From the juice of the leaves of many species a drug is obtained, known as aloes, which is of much value in medicine. The drug is found in various forms, but all agree in possessing an extremely bitter taste. Formerly the chief source of the drug was Socotra, but it is now imported from various parts of the world.

The concentrated principle of aloes is called "aloin."

Aloes Wood. (Fr. *Bois d'aloès.* Ger. *Aloeholz*, Sp. *Madera de aloe.*)

Also called eagle wood. It is the lign aloes of commerce, and is the product of the *aquilaria agallocha*, a native of tropical Asia. Aloes wood contains a fragrant resinous substance, which is much used in the East as a medicine and as a perfume.

Aloin.

(See *Aloe.*)

Alpaca. (Fr. *Alpaga*, Ger. *Alpaca*, Sp. *Alpaca.*)

The long, silky, lustrous wool obtained from the animal of the same name (of the same genus as the llama), largely bred and domesticated in Peru and other South American States. Each animal produces from 10 to 12 lbs. in weight of wool.

Alpaca became an article of commerce about half a century ago. It is enormously used for the manufacture of shawls, coatlinings, cloth for warm countries, umbrellas, etc. More than 2,000,000 lbs. are imported annually into Great Britain. The chief seat of the manufacture is the West Riding of Yorkshire, especially Bradford and Saltaire.

Vienna and guanaco are different species of alpaca. The colour is of various shades—black, grey, and brown.

Alpiste. (Ger. *Kanariensamen.*)

The French and Spanish name for canary seed.

Alum. (Fr. *Alum*, Ger. *Alaun*, Sp. *Alumbre.*)

A crystalline compound composed of sulphate of potash, sulphate of alumina, and water, which unite and form into octahedra or into cubes. Its chemical symbol is K_2SO_4 Al_2 $3SO_4$ $24H_2O$. It is a colourless substance of a sweetish, astringent taste, and is soluble in water. It is useful in medicine as an astringent for the prevention of hæmorrhage. In commerce it is employed in the manufacture of the so-called lake colours, and it is valuable as a mordant in dyeing processes. This last mentioned property is owing to the presence of alumina, which has a strong attraction for textile tissues, and also for colouring matters. Thus it is the means of fixing colours in cloth. Alum is often mixed with poor flour in order to give a whiteness to bread.

Alum is obtained in large quantities near Whitby, and in the neighbourhood of Glasgow, in the shape of alum ore. The consumption in England is more than 700 tons each week.

Alumina. (Fr. *Alumine*, Ger. *Alumina*, Sp. *Alumina.*)

The oxide of aluminium. It occurs largely in nature, and in its pure state is known as corundum. When alumina is coloured with small quantities of metallic oxides it occurs as the sapphire, the ruby, and the topaz, in a less pure state as emery, and when combined with water as the mineral diaspore. It is valuable in commerce for its properties in acting upon the fibres of cloth, etc., as a mordant, and in fixing colours.

Silicate of alumina is the basis of clay soils, and of many rocks and minerals. The most important aluminiferous minerals are felspars, which also contain silicates of potassium or sodium. By the gradual action of air and water the rocks crumble down, the felspar contained

in them splitting up into soluble salts of potash and insoluble silicate of alumina. Different varieties of soils have been formed by this disintegration.

Aluminium. (Fr. *Aluminium*, Ger. *Aluminium*, Sp. *Aluminio.*)

A white metal found in clay, felspar, slate, and other rocks. The most convenient source of aluminium is bauxite, a clay found at Les Baux (France), which has replaced the cryolite obtained from Greenland. The metal is extremely light—its specific gravity being only 2·5—and takes a high polish. It is used as an alloy with most metals, but will not amalgamate with mercury. It is especially valuable in the manufacture of mathematical and optical instruments, where lightness and durability are essential qualities. It is also useful for castings. Latterly its value has been recognised in the building of ships and boats, particularly torpedo boats, and as it is now very cheap it will probably be applied to more and more metal manufactures.

Aluminium bronze is a compound of copper and aluminium—the latter to the extent of about ten per cent.—and is much used in the manufacture of cheap jewellery.

Amadou. (Fr. *Amadou*, Ger. *Amadou*, Sp. *Amadou.*)

A preparation obtained from various species of fungi which grow upon old trees in Great Britain and on the Continent. It is sometimes used as tinder, but its chief value is as a styptic in surgery. Soft amadou is sometimes employed in the manufacture of surgical pads. In Franconia the inhabitants have discovered a method of making a material resembling chamois skin from amadou, and this is worked up into very warm garments.

Amalgams. (Fr. *Amalgame*, Ger. *Amalgam, Verquickung*, Sp. *Amalgamas.*)

Under this name are included the alloys which mercury forms with certain metals. Mercury combines easily with lead, bismuth, zinc, tin, silver, and gold, less easily with copper, and not at all with iron, nickel, cobalt, and platinum. It is on account of this property which mercury possesses of combining with most metals that it is utilised for separating some metals from their ores, especially gold and silver. A solid amalgam of tin is employed for the purpose of silvering looking-glasses.

Amber. (Fr. *Ambre*, Ger. *Bernstein*, Sp. *Ambar.*)

The fossil resinous exudation of certain extinct species of conifers. Hard and brittle, it varies in colour from pale yellow to reddish-brown. It is generally transparent, though sometimes it is found clouded and opaque. Amber is mainly used for the manufacture of personal ornaments, especially pipe mouth-pieces, beads, etc., and is much prized in the East. Though found in small quantities in various parts of the world, the greater portion of the market supply is derived from the shores of the Baltic, the annual value of the amber obtained there being about £70,000. Its chemical symbol is $C_{10}H_{16}O$.

Ambergris. (Fr. *Ambre gris*, Ger. *Graue Ambra*, Sp. *Ambargris.*)

A speckled grey fatty substance, so called on account of its fancied resemblance to raw amber. It is generally believed to be an exudation of the spermaceti whale, and is found floating in the sea, or thrown up on the shores of Greenland, China, Japan, the West Indies, and Brazil. It has a peculiar sweet, earthy odour. Its use is confined to perfumery to increase the fragrance of other perfumes. It is extremely costly, its price varying from £2 to £6 per ounce. Most of the ambergris which is imported into Great Britain comes from the Bahamas.

Amberite. (Fr. and Ger., *Amberite*, Sp. *Ambarite.*)

The name given to a smokeless powder which is mainly composed of gun cotton, barium nitrate, and solid paraffin.

Amboyna Wood. (Fr. *Bois d'Amboyne*, Ger. *Amboynaholz*, Sp. *Madera de Amboyna.*)

The beautiful Indian mottled wood obtained from the *pterospermum Indicum.* It is highly prized by cabinet makers, and is largely used for inlaying.

Amethyst. (Fr. *Améthyste*, Ger. *Amethyst*, Sp. *Ametista, Ametisto.*)

One of the most esteemed varieties of quartz, and differing from common quartz by reason of its beautiful violet

blue colour, which is caused by the presence of peroxide of iron, or of manganese. It is used for seals, rings, etc. Owing to its abundance it is cheaper than other gems. The finest specimens are obtained from India, Ceylon, and Brazil; but the amethyst is common in Europe, especially in many parts of Scotland. A variety of the sapphire, of a purple colour, is known as the "oriental amethyst."

Ammonia. (Fr. *Ammoniaque*, Ger. *Ammoniak*, Sp. *Amoniaco.*)

A gaseous compound of nitrogen and hydrogen, the chemical symbol being NH_3. The gas is much lighter than air, and has a characteristic suffocating smell. It is extremely soluble in water, and the strong solution is known as *liquor ammonia*. Ammonia is a valuable reagent in chemical analysis, and is used medicinally, both internally and externally. Its salts are very numerous and useful in commerce. Sulphate of ammonia serves as a top-dressing for farmers, and is frequently mixed with other manures. Carbonate of ammonia is valuable as smelling salts, and its solution is known as "Sal Volatile." Nitrate of ammonia is resolved into "laughing gas" and water.

Ammoniacum. (Fr. *Gomme ammoniaque*, Ger. *Gummi-ammoniak*, Sp. *Goma amoniaca.*)

A medicinal gum resin, valuable on account of its stimulating qualities. It is a product of the *Dorema ammoniacum* of Persia, and is obtained by exudation.

Amontillado. (Fr., Ger., and Sp., *Amontillado.*)

The name of a very pale and dry sherry.

Amygdalin.

(See *Oil of Almonds.*)

Anchovy. (Fr. *Anchois*, Ger. *Sardellen*, Sp. *Anchoa, Anchova.*)

A small fish of the herring family, from two to eight inches in length. It is very abundant off the Mediterranean shores, and a very large trade is carried on in tinning anchovies at Cannes, Frejus, and St. Tropez. Anchovies are chiefly used in the preparation of condiments.

Anchovy Pear. (Fr. *Poire d' anchois*, Ger. *Birnsardellen*, Sp. *Pera de anchoa*)

The fruit of a tree which grows largely in Jamaica, and which is used in the manufacture of pickles. In taste it bears a strong resemblance to the mango.

Angora. (Fr. *Chèvre d'Angora*, Ger. *Angora-Ziege*, Sp. *Cabra de Angora.*)

The trade name of a breed of goats, derived from the capital of a province of Asia Minor. These goats have long silky curling hair, of which mohair is the principal. In Turkey the finest garments are made of Angora wool. Elsewhere it is chiefly used for trimmings, braids and shawls. The chief seats of manufacture in England are Norwich and Bradford. Latterly a species of Angora goat has been bred in the United States, Cape Colony, and Victoria (Australia) for the sake of the wool. The annual value of the wool obtained from Turkey is about £700,000; from all parts about £1,000,000.

Angostura Bark. (Fr. *Ecorce d'Angostura de Columbie*, Ger. *Angusturarinde*, Sp. *Corteza de Angostura.*)

Also called Cusparia Bark. It is obtained from the *Galipea cusparia* and *Galipea officinalis*, natives of the tropical regions of South America. The name is derived from Angostura, in Venezuela, where it is an article of considerable commerce. It is sometimes called true Angostura to distinguish it from false Angostura, which is a poisonous product supplied by *strychnos nux vomica*, and for which it was sometimes mistaken with disastrous results. It is a valuable tonic in dysentery and similar ailments, and is also useful as a febrifuge. Its virtues arise from the presence of a volatile oil and bitter principle, the nature of which is uncertain. In England its use is confined to the preparation of aperitive wines.

Angostura Bitters. (Fr. *Amers d'Angostura*, Ger. *Angustura-bittern*, Sp. *Amargos de Angostura.*)

The well-known and esteemed bitter of commerce. It is an essence into the composition of which enter various aromatics—especially angostura, camilla, cinchona, and lemon. Much is sold which contains no angostura at all. Originally prepared at Angostura, it is now chiefly produced at Siegert, in Trinidad.

Aniline. (Fr. *Aniline*, Ger. *Anilin*, Sp. *Anilina.*)

Aniline was discovered in 1826, but it remained merely an article of the laboratory until its useful properties in the production of the aniline colours became known. All the aniline now manufactured is obtained from coal tar, which, upon distillation, produces benzene. When benzene is treated with strong nitric acid nitro-benzene is formed, and this when mixed with acetic acid and iron filings yields acetate of aniline. Aniline may also be prepared by passing a mixture of benzene and ammonia through a hot tube.

Aniline is an oily colourless liquid when it is quite pure, but darkens rapidly when it is exposed to the air. Its chemical symbol is $C_6H_5NH_2$. Specific gravity, 1·02; boiling point, 182°C. Its odour is strong and of an ammoniac character, and its taste is weak and aromatic. Though it is not very soluble in water it dissolves readily in alcohol and ether. Owing to its poisonous character great care is required in its use.

When aniline is treated with chloride of lime it gives rise to a beautiful violet colour. Nearly half a century ago it was discovered that if the colour thus produced was purified it could be fixed with the greatest ease upon silk and woollen fabrics. By degrees all other colours were obtained. There is no need of a mordant in fixing aniline colours upon silk and woollen materials, simple immersion in a solution of aniline being sufficient. In the case of vegetable tissues, however, a previous preparation is necessary.

Aniline colours have practically superseded all other dyes, owing to their great brilliancy, their diversity of colour and shade, and the ease with which they can be fixed. The trade has increased rapidly during the last twenty years. Owing to her energy Germany has almost a monopoly in the manufacture of these colours, although she was later in the field than England and France. The annual value of the German products is over five millions sterling, whilst that of England is less than one third of that amount.

Anime. (Fr. *Résine animé*, Ger. *Anime, Gummi-Anime*, Sp. *Goma animé.*)

A kind of resin, obtained from various species of trees, but principally from the *Hymenæa Mossamticensis.* It is also known as African copal, and is imported into this country from Zanzibar. Another kind of anime is obtained from the West Indies. It is yellow in colour, transparent, and of a pleasant smell, especially when it is warmed. It is used for varnishing. Over one million pounds are imported into England annually.

Aniseed. (Fr. *Anis, Grains d'anis*, Ger. *Anis*, Sp. *Anis, Simiente de anis.*)

The aromatic fruit of the anise. It contains an essential oil which is used for flavouring cordials and medicine, and in the preparation of certain kinds of liqueurs. Aniseed is obtained from Russia and Germany, but the best comes from Alicante, in Spain. Anise water, a preparation from anise oil and water, is much used in Italy as a cooling drink.

Aniseed, Star. (Fr. *Anis étoilé*, Ger. *Sternanis*, Sp. *Anis de la China, Badiana.*)

The fruit of the *Illicium avisatum*, a tree resembling the laurel. It is held in high esteem in Japan and China, and in England it is valuable as a spice and as giving a flavour in cooking. It is mainly obtained from China and Singapore.

Anisette. (Fr. *Anisette*, Ger. *Aniset, Anisbranntwein*, Sp. *Anisete.*)

A cordial made chiefly at Bordeaux and Amsterdam from the seeds of the anise. It bears a strong resemblance to the Russian *kummel.*

Annatto. (Fr. *Rocou*, Ger. *Anottâ*, Sp. *Annatto.*)

Also known in commerce as Arnotto, Roncou, and Orleana. It is the fine yellowish-red colouring substance obtained from the pulp surrounding the seeds of the *Bixa orellana*, a tree of medium size which grows in Guiana and other tropical parts of South America. It is extensively employed for giving a colour to milk, cream, and cheese, and both in cake and fluid form it is an article of considerable importance in all the dairy districts of the United Kingdom and America. It is absolutely tasteless and harmless, and it has no other effect upon the substance into which it is introduced than to give it a yellowish tinge. Annatto is

also used for dyeing cloth, and for giving a bright colour to varnishes.

Anthracene. (Fr. *Anthracen*, Ger. *Anthracen*, Sp. *Antracino.*)

A compound which is obtained by the distillation of coal tar. Its chemical symbol is $(C_6H_4)(CH)_2$. Its commercial value is very great, as it is the source of alizarine.

Anthracite. (Fr. *Anthracite*, Ger. *Anthracit*, Sp. *Antracito.*)

A species of stone coal, of the hardest and most dense kind, with a shining surface. It is much used for steam fuel, and burns extremely well in furnaces. It is almost smokeless and contains ninety per cent. of carbon. This coal is worked largely in South Wales, but the largest deposits are in Pennsylvania.

Antimony. (Fr. *Antimoine*, Ger. *Antimon*, Sp. *Antimonio.*)

A crystalline metal of a bluish white colour. Its principal ore is stibnite or sulphide of antimony. It occurs in Germany, Hungary, France, America, Great Britain, and Borneo. Metallic antimony is extremely brittle, and is easily reduced to powder. It is chiefly valuable for its alloys, and when fused with most metals increases their hardness. Type metal and Britannia metal contain a considerable quantity of antimony. It is used in many compounds, and in medicine it is valuable in the preparation of tartar emetic.

Antlers. (Fr. *Andouillers*, Ger. *Hirschgeweih*, Sp. *Cornamenta, Las cuernas del ciervo.*)

The outgrowths from the frontal bones of the deer family, which possess the chemical properties of true bone. Except in the case of the reindeer, antlers are restricted to the males. They are shed periodically. When they have been sawn and filed to the shape required the exterior of the deer horn is useful, in its natural state, as an ornament, and for the handles of knives and instruments which require a firm grip.

Apatite. (Fr., Ger., and Sp., *Apatite.*)

A mineral largely imported into the United Kingdom, especially from Norway and Canada, for manuring land. It is mainly composed of native phosphate of lime, mixed with chloride and fluoride of calcium. It is of a beautiful bluish-green colour and crystalline in form. Its importance as a fertilizer has rapidly increased owing to the decline in quality and quantity of Peruvian guano.

Apollinaris Water. (Fr. *Eau d'Apollinaris*, Ger. *Apollinariswasser*, Sp. *Agua de Apollinaris.*)

A favourite mineral water obtained from the Apollinaris Spring in the valley of the Ahr, in the Rhine provinces. It is largely impregnated with carbonate of soda.

Apples. (Fr. *Pommes*, Ger. *Apfel*, Sp. *Manzana.*)

The fruit procured from the cultivated varieties of the *pyrus malus*. There are about two thousand varieties of the apple-tree, and the commerce in the fruit is enormous. The tree is, indeed, the most widely distributed of all fruit trees. Besides being used for dessert, the apple is valuable for the manufacture of cider. The apple contains malic acid, which is used for medicinal purposes, and owing to the presence of this substance a vinegar and a spirit are made from the fruit in Switzerland. In England the cultivation of the apple is mainly carried on in the west. The importations into the United Kingdom are very large, the continent of Europe and North America supplying almost every demand. From America come Baldwins, Greenings, Russets, and Newtown pippins. Tasmania has lately grown a great quantity of this fruit, and there is a growing export trade in the same.

The wood of the tree is hard, durable, and fine-grained, and the bark contains a yellow dye.

Apricot. (Fr. *Abricot*, Ger. *Aprikose*, Sp. *Albaricoque.*)

The well-known fruit of different varieties of the *prunus Armeniaca*. There are various forms and varieties of this fruit, the most famous being the Royal, Turkey, Moorpark, and Breda. It is a native of Armenia, though now cultivated in many parts of the world. From its kernel prussic acid may be obtained, and by distillation the French eau de noyaux is also derived from it.

Aqua Fortis. (Fr. *Eau forte*, Ger. *Scheidwasser*, Sp. *Agua fuerte.*)

The name given by old chemists to

dilute nitric acid, and still commercially applied to it, on account of its corrosive action on many substances.

Aquamarine. (Fr. *Aigue-marine*, Ger. *Aquamarin*, Sp. *Aguamarina.*)

A precious stone. It is a name that is sometimes popularly given to the beryl, on account of its sea-green colour. It has almost the same chemical combination as the emerald, but its commercial value is considerably less. The best stones are obtained from Ceylon, but good ones are also found in Brazil and Siberia.

Aqua Regia. (Fr. *Eau régale*, Ger. *Königswasser*, Sp. *Agua regia.*)

A mixture of nitric acid and hydrochloric acid in the proportions of one to two. Its chief use is to dissolve gold and platinum. The name was given to it because it alone would dissolve gold—the king of metals.

Arabin. (Fr. *Arabine*, Ger. *Arabin*, Sp. *Arabino.*)

The principal constituent of gum arabic, in which it occurs mixed with lime and potash. By the addition of alcohol to a solution of gum arabic in water, the pure arabin is deposited in white flocks. It contains large quantities of carbon, oxygen, and hydrogen, and its composition is similar to that of starch.

Archill. (Fr. *Orseille*, Ger. *Orseille, Färberflechte*, Sp. *Orchilla.*)

Sometimes called Orchill. It is a violet red paste, prepared from various kinds of dull grey-coloured lichens. Archill liquor is a product obtained by the action of ammonia, air, and heat on a decoction of the lichens. The colour is developed by putrefaction. It is soluble in water as well as in alcohol. It is chiefly employed in dyeing silken fabrics a rich lilac colour, the colour being easily acted upon by the rays of the sun. It is less commonly used for dyeing cottons and woollen cloths. Archill is obtained from the Levant, the Canary Islands, and Cape Verd Islands.

Areca. (Fr. *Araca*, Ger. *Areca*, Sp. *Areca.*)

A genus of palm. The tree grows in various parts of the East Indies, and is cultivated on account of its nuts. There are two species of areca, and each of them is remarkable for the purposes to which its fruit is applied. One is the *Areca catechu*, also known as the Betel-nut palm, which is one of the most beautiful trees of the East Indies. The nuts of this palm are imported into European countries for the manufacture of tooth powder. The other is the *Areca obracea*, or cabbage palm, a tall tree of the West Indies. It is cultivated for the sake of its leaves, which are sometimes eaten like cabbages.

Argil. (Fr. *Argile*, Ger, *Thon*, Sp. *Arrilla.*)

Otherwise argol. This is the crust or deposit found in wine casks or vats. It is a fine crystalline powder, and is white or red according to the colour of the wine which has been contained in the cask. It is an impure bitartrate of potash. Argil is largely exported from Portugal, and is used for dyeing dark shades. Its chief value in commerce, however, is in the preparation of tartaric acid and cream of tartar.

Arnica. (Fr. *Arnique*, Ger. *Arnika*, Sp. *Arnica.*)

A plant which is sometimes known by the French as mountain tobacco. It was formerly considered to have peculiar medicinal qualities, being used as a stimulant in cases of fever, ague, and palsy, but latterly it has been neglected. A tincture is still obtained from its flowers, which is applied to wounds and bruises. The plant also yields quantities of tannin, resin, a volatile oil, and an alkaloid called arnicin.

Aromatics. (Fr. *Aromates*, Ger. *Gewürze, aromas*, Sp. *Especias.*)

Substances which possess an agreeable odour, and are prized on that account. Many of them are the sources of perfumery. Their properties are due to the presence of the essential oils. In chemistry the term aromatic series is applied to a large number of chemical compounds, which occur in balsams and other substances having an agreeable odour.

Aromatic Vinegar. (Fr. *Vinaigre aromatique*, Ger. *Gewürzhaftessig*, Sp. *Vinagre aromatico.*)

A perfume which is compounded of strong acetic acid and various essences. It is a refreshing and stimulating preparation and is valuable in cases of headache.

Arrowroot. (Fr. *Arrow-root*, Ger. *Marantastärke, Pfeilwurz* Sp. *Almidon.*)

A species of starch which is obtained by grinding and washing the tubers of various plants. The best kind is derived from the *Maranta arundinacea*, the *Canna*, and the *Tacca*. The West India Islands are the principal source of the supply of arrowroot, and the most prized is obtained from the Bermudas. When prepared it is a light, opaque, white powder, and crackles when rubbed. Although it is absolutely without odour when it is dry, it possesses a peculiar smell on being dissolved in boiling water. Immense quantities are imported into Great Britain, mainly from the Bermudas. Arrowroot has long been much valued as a delicacy, and as an easily digested food for children and invalids.

Arsenic. (Fr. *Arsenic*, Ger. *Arsenik*, Sp. *Arsénico.*)

A chemical element that is used in the arts for the purposes of hardening other metals, and also in medicine. In certain forms, however, it is a most deadly poison. It sometimes occurs free in nature, but it is most frequently found in combination with sulphur and the metals, from which it is obtained by roasting the ore. Arsenic is a brittle, crystalline substance of a steel-grey colour, and has metallic lustre. In shot-making a small portion of arsenic is always mixed with the lead to give it hardness.

Arsenious Acid. (Fr. *Acide arsenicu, Arsenic blanc*, Ger. *Arsenige Säure, Giftmehl*, Sp. *Acido Arsenical.*)

This is the most familiar of all the compounds of arsenic, and is commonly known as white arsenic. It is of importance on account of its uses in medicine and the arts. In some countries arsenious acid is taken medicinally for the purpose of allaying malarial fever and also for clearing the complexion. When given in small doses to horses it has the effect of improving the appearance of their skins, and making them bright and glossy.

Artichoke. (Fr. *Artichaut*, Ger. *Artischoke*, Sp. *Alcachofa.*)

An edible legume derived from the thistle-like plant *Cynara scalymus*. The plant is a native of Barbary, but is now grown largely in the south of Europe. It is the flower-head of the plant which is the article of commerce, immense quantities of the heads being exported to all parts of the world. The Jerusalem artichoke (*Helianthus tuberosus*) is a totally different plant, the tuber being the most valuable part and the article of commerec.

Artificial Fuel.

(See *Briquette.*)

Asafoetida. (Fr. *Assa foetida*, Ger. *Stinkender-asant*, Sp. *Asafetida.*)

Or Assafoetida. A gum resinous exudation obtained from the milky juice of the *ferula asafoetida* and the *ferula narthex*. It is a product of Persia and Afghanistan, and is useful in medicine on account of its stimulating and antispasmodic properties. It is also usefully employed in cases of hysteria, flatulence, and chronic catarrh. In India, asafoetida enters into the preparation of curries and condiments. Its smell is somewhat disgusting, much resembling that of garlic, and owing to this fact its use is not likely to be common at any time.

Asbestos. (Fr. *Asbeste, Amiante*, Ger. *Asbest, Amianth*, Sp. *Asbesto, Amiento, alumbre de pluma.*)

This is a mineralogical term, used rather to denote a peculiar form assumed by several minerals, than to designate any particular species of mineral. It is, however, generally applied to varieties of hornblende, or pyroxene, which occur in long slender crystals, placed side by side, so as to produce a flexible fibrous mass. Its chief constituents then are silica, magnesia, lime, and oxide of iron. In colour it is white or green, and possesses a silky or glossy lustre. The finest variety of asbestos is called *amianthus*, a word signifying "unpolluted," because cloth made from it was cleansed by passing through fire. The meaning of the word asbestos is "indestructible," and its most remarkable property is resistance to flame. For that reason it has recently come into general use in the construction of gas fire stoves. From very early times it has been employed in the manufacture of fire-proof cloth, and it is now a most valuable substance for many engineering and mechanical purposes. In various forms it is used for the making of steam joints, for filling

the stuffing boxes of engines, for chemical filters, for covering steam pipes, for rendering buildings fireproof, for lining the engine-rooms of steamships—since it is a non-conductor—and for covering the wires used in electric lighting. The best amianthus is obtained in various parts of Corsica, in Cornwall, and also in certain districts of Scotland. The ordinary article of commerce, however, is mainly obtained from Canada, Italy, New South Wales, and Tasmania. There is no doubt that the use of asbestos is capable of great extension as its valuable properties become better known.

Asphalte. (Fr. *Goudron minéral*, Ger. *Asphalt*, Sp. *Asfalto.*)

A composition of pitch, earthy, elastic, and compact, used for paving roadways, for cementing roofs, and as a lining for cisterns and iron pipes. It is a fossil hydrocarbon, and is obtained from mines, being found either on the surface or imbedded in the earth. Immense quantities are imported into Great Britain, mainly from Trinidad. It is the principal ingredient in Japan varnish. Asphalte is supposed to be a product of the distillation of carbonised vegetable matter by the action of subterranean heat and moisture in the absence of atmospheric air.

Attar of Roses.

(See *Otto of Roses.*)

Aventurine. (Fr. *Aventurine*, Ger. *Aventurine*, *Aventurinstein*. Sp. *Venturina.*)

A mineral studded with gold spots, sometimes used for jewellery. It is a vitreous variety of quartz, and reflects light with great brilliancy, but is not so valuable as the finer kinds of amethyst. Aventurine is found in various parts of Europe and Asia, but the chief supply is obtained from the Ural Mountains.

Avocado Pear.

The fruit of the *Persea gratissima*, of considerable size, some of the pears weighing as much as 2 lbs. In the West Indies it is largely consumed and much prized. From the pulp an excellent illuminating oil is obtained, and its seeds give a black dye which is useful for marking linen.

Azurite. (Fr. *Outremer*, Ger. *Azurblau*, Sp. *Azur, Lapislazuli.*)

Blue carbonate of copper, or blue malachite—a valuable copper ore. It occurs in very beautiful crystals in the south of France, and is found in various parts of England. The name is also given to lazalite—a compound of phosphate of alumina and magnesia.

Babool. (Fr., Ger., and Sp. *Babool.*)

The name given in India to the *Acacia Arabica*, of which the bark and the gum are articles of commerce. The gum very closely resembles gum arabic, and is constantly used as a substitute for it. The bark and the pods are valuable in tanning.

Badger. (Fr. *Blaireau*, Ger. *Dachs*, Sp. *Tejado.*)

A carnivorous animal of the weasel and otter kind. It is hunted for the sake of its skin and hair. The former is used for various purposes, in particular the covering of trunks, whilst the wiry hair is valuable for the manufacture of brushes. The American badger is quite distinct from the European. The fur of the former is more especially prized, owing to its softness and fineness. In the winter it is greyish in colour, but in the summer it turns to a yellowish-brown.

Bael or Bhel Fruit. (Fr. *Baële*, Ger. *Baël*, Sp. *Bael.*)

The fruit of the *ægle Marmelos*, or Bengal quinces, closely allied to the orange. It has a delicate taste and fine odour, and is the original source of marmalade. The rind of the unripe fruit is astringent, and is used as a remedy in cases of diarrhœa and dysentery. A perfume is obtained from the rind, and also a yellow dye. Its seeds yield a cement.

Baize. (Old Fr. *Baies.*)

A coarse, woollen fabric with long nap, mainly used for flooring and for wrapping materials. It is sometimes made up into curtains, linings, etc.

Balata. (Fr., Ger., and Sp., *Balata.*)

A gum which is the product of the *Mimusops globosa*. It is the milky juice of the tree which furnishes balata. In quality it is very like gutta percha and indiarubber, and is specially suitable for belting. The trade in this article is not very great, and all the requirements of Great Britain are supplied by British Guiana. There is another tree called the balata or bully tree, which produces very hard timber.

Baleen. (Fr. *Baleine*, Ger. *Fischbein*, Sp. *Ballena.*)

The horny plates which are attached to the palate of the whalebone whales. These constitute the whalebone of commerce. The length of the plates varies from ten to fourteen feet. There are about two hundred plates on each side of the mouth.

Balsams. (Fr. *Baume*, Ger. *Balsam*, Sp. *Balsamos.*)

Different species of liquid resins or saps, of a more or less agreeable odour, which are derived from various plants. They are most commonly procured by incisions being made in the stems or branches. When first obtained they are liquid or semi-liquid, glutinous, and aromatic. By exposure to the air they become thick and then solid. Frequently they contain an acid of the aromatic series. The kinds of balsam are very numerous. Canada balsam is useful for mounting microscopical objects, Copriba balsam is used for lac varnishes and tracing paper, whilst others are employed in the manufacture of perfumes and as expectorants. The name at one time comprehended all medicines compounded of resins and oils. When now used, without any addition, balsams of Peru and Tolu are understood.

Bamboo. (Fr. *Bambou*, Ger. *Indianisches Rohr*, Sp. *Bamboa, Caña de Indias.*)

The hollow silicious coated stems of a gigantic species of grass. These grasses grow in clumps in the tropics, and are of many kinds. In the countries where they are grown the commercial uses of bamboos are most varied, ranging from the commonest domestic articles to building purposes. When split they are made into mats, sails, masts, pipes, etc. Large importations are made into Europe from the tropical parts of both the Old and the New World, and they are converted into walking and umbrella sticks, stakes for flowers and for training fruit trees, and they are further utilised in the manufacture of fishing rods and wicker-work.

Banana. (Fr. *Banane*, Ger. *Banano*, Sp. *Banana.*)

The fruit of the tropical banana tree, a species of tree allied to the plaintain, though the fruit itself is sweeter than that of the plantain. Bananas are now grown most extensively in the West Indies, and there is an enormous export trade from the various islands, Jamaica supplying the wants of the United States, as well as a large part of the demands of Europe. The fruit is gathered in bunches, and must be shipped green, as it is very perishable when ripe. There are two kinds—red and yellow skinned. The largest yellow kind are obtained from the mainland of Central America, the small yellow from Jamaica, and the red from Cuba.

Bancoul Nuts. (Fr. *Noix bancouls*, Ger. *Bancoulnusse*, Sp. *Nuez de bancoul.*)

The name given to the seeds of the *Aleurites ambinux*. From these seeds an oil is extracted which has medicinal properties much like those of castor oil. It is, however, more fluid than castor oil, and has neither taste nor smell. The importations from India are small, and its main use, other than medicinal, is for the preparation of artists' oil.

Bandana. (Fr. *Indienne*, Ger. *Gedruckter calico*, Sp. *Bandanno.*)

A species of printed handkerchief or printed cotton goods, originally made in India, but now extensively made in Britain, and intended largely for the Eastern market. The cotton or cloth used, and the former is the more common, is first dyed Turkey red, and then the pattern is made by discharging the colour with bleaching liquor in a powerful Bramah press. The pattern to be discharged is cut out in two plates of lead or other metal of the size of the handkerchief. From twelve to twenty handkerchiefs are acted upon at the same time.

Baobab. (Fr. *Baobab*, Ger. *Baobal*, Sp. *Baobal.*)

A tree of magnificent size, a native of West Africa, but introduced in modern times into the East and West Indies. In tropical countries the leaves are used for medicinal purposes, especially in cases of diarrhœa and fever. Its bark is imported into this country as a material for making paper, whilst the fibres of its stems are useful for the manufacture of ropes.

Bareges. (Fr. *Crêpe de Barèges*, Ger. *Bareges*, Sp. *Bareges.*)

Thin mixed fabrics used for ladies'

dresses intended for summer wear. The name is derived from the town of Barèges, in the Pyrenees, where the manufacture was originally carried on. The best kinds are made of a mixture of silk and worsted, whilst for the inferior sorts cotton and worsted are used. The fabrics vary considerably in colour, and are often of a light tint with printed patterns.

Barilla. (Fr. *Barille*, Ger. *Barilla, Spanische soda*, Sp. *Barilla.*)

An impure carbonate of soda. It is the Spanish name for the alkali or ash which is left over after burning such plants as the *Salsola soda*, cultivated on the coasts of Spain, France, and Italy. That prepared in Brittany is known as *varec*. Formerly barilla was the principal source of carbonate of sodium, an article extensively used in the manufacture of glass and soap, and in other industrial arts. Its use has rapidly declined in recent years owing to the fact that carbonate of sodium is now made chiefly from common salt.

Barium. (Fr. *Baryte*, Ger. *Barium, Verbindungen*, Sp. *Bario.*)

The metal present in heavy spar (sulphate of baryta) and baryta. It is one of the so-called alkaline earths, other members of which are strontium, calcium, and magnesium. As yet it has only been obtained as a powder which is yellowish in colour. Its principal use is in the preparation of oxygen, though in the arts it is often employed for adulterating white paints. The carbonate of barium is employed as a pigment, and in the manufacture of certain kinds of glass.

Bark. (Fr. *Écorce*, Ger. *Baumrinde*, Sp. *Corteza.*)

The outer coating of trees.

Great varieties of barks are used medicinally and also for the purposes of tanning. Each of the principal kinds is noticed under a separate heading.

Barley. (Fr. *Orge*, Ger. *Gerste*, Sp. *Cebada.*)

The edible seed of one of the cereal plants (*hordeum*). There are many varieties of barley grown, and its cultivation is more widely spread than that of any other grain crop. Large quantities are raised in the United Kingdom, especially on the lighter arable lands of Norfolk and Suffolk, and there are considerable imports into this country from Denmark, Siberia, the United States, Canada, and Mexico. The principal demand in Great Britain is for malting purposes. Pearled barley is barley which has been husked and treated by machinery for use in thickening broth and soups.

Bast. (Fr. *Teille, tille*, Ger. *Bast*, Sp. *Baste.*)

The name usually applied to the inner bark of trees, especially to that of the linden tree. It is employed for making certain kinds of ropes, the well-known bast-mats, and the ordinary shoes worn by the Russian peasants. It also serves as a useful packing for furniture and as a covering for tender plants. Bast, and bast mats are almost exclusively exported from Russia, the chief port carrying on the trade being Archangel. In the south of Europe lime tree bast is also used for making certain kinds of hats. There is also another kind of bast obtained in the West Indies, principally in Cuba, from the *Paritium elatum*. It is used for tying up bundles of Havana cigars.

Bath Brick.

A yellow brick of siliceous material made from a mixture of sand and clay, found in the river Parret, near Bridgwater, in Somerset. It is mainly used as a scourer, cleaner, and polisher of metals, and especially knives. The bricks are made of an average weight of 3 lbs., and the total annual manufacture amounts to nearly 10,000 tons.

Bath Stone.

A lime stone of a rich creamy colour, composed of 94½ per cent. of carbonate of lime, and 2½ per cent. of carbonate of magnesium. It is entirely free from silica. On account of its beauty, it is extensively used for building purposes. It is found in large quantities in Wiltshire and Somerset, especially in the neighbourhood of Bath. When taken from the quarry the stone is somewhat soft, but it quickly hardens on exposure to the air. Unfortunately its durability is not great.

Batiste. (Fr. *Batiste*, Ger. *Batist*, Sp. *Batista.*)

The usual French name for cambric, a commercial article which is composed of a fine texture of linen or cotton.

Battens. (Fr. *Lattes*, Ger. *Latten*, Sp. *Latas.*)

Sawn fir timber of varying lengths and thicknesses. They are used for flooring, for roofing below slates, and they are also placed upright on walls preparatory to laths being fixed for plastering. The best battens come to this country from Norway, and are generally imported in lengths of from 12 to 14 feet, 7 inches broad, and 2½ inches thick.

Bayberry. (Fr. *Baie de laurier*, Ger. *Lorbeere*, Sp. *Baya del laurel.*)

The fruit of the sweet bay—*Laurus nobilis.* It is used as a tonic in veterinary medicine, and it is likewise useful in the preparation of certain condiments. From the fruit a concrete oil is also obtained.

Bay Rum. (Fr. *Huile de laurier*, Ger. *Lorbeeröl*, Sp. *Aceite de bayas de laurel.*)

A spirituous perfume made chiefly in the West Indies. It bears a strong resemblance to Eau de Cologne. Its use is mainly confined to toilet purposes, though it is sometimes employed as a liniment in cases of rheumatism.

Bdellium. (Fr. *Bdellium*, Ger. *Bdellium*, Sp. *Bedelio.*)

A gum resinous exudation, very much like myrrh, for which it forms a good substitute. There are two kinds, one African, which is translucent, but has a dull fracture, and the other Indian, which is opaque. At one time bdellium was considered to possess great medicinal qualities as a stimulant, but it is now rarely used except as an ingredient in plasters. It has a bitter taste. The small quantity imported in Great Britain comes from India and West Africa.

Beads. (Fr. *Perles*, Ger. *Unechte Perlen*, Sp. *Cuentas.*)

A variety of personal ornament, usually globular in form, with a hole through them so that they may be strung together, and worn as necklaces, bracelets, etc., or worked on cloth or some other substance as a kind of embroidery. They are made of various materials, such as glass, ivory, porcelain, jet, coral, amber, etc. There are large importations of beads into Great Britain, chiefly from Italy, Holland, France, and Germany, and they are re-shipped to Africa, where they are bought by the natives. Venice is the principal seat of the manufacture of fancy glass beads, whilst Paris does a considerable trade in imitation gems. In England plain beads are made in Birmingham.

Beam. (Fr. *Poutres*, Ger. *Balken*, Sp. *Baos.*)

The name given to any long piece of wood or iron, made for the purpose of resisting force or carrying weight. Iron beams are generally known as girders. The name has many technical applications in the arts.

Beam Tree. (Fr. *Alisier blanc*, Ger. *Eberesche*, Sp. *Serbal bravio.*)

A tree very commonly met with in all parts of Europe, with a straight erect trunk, and varying in height from twenty to forty feet. The fruit of the beam-tree is not of much use, but its wood is very hard, and has a fine close grain. It is of a yellowish white colour, is easily stained, and takes a high polish. It is useful in turnery, and is employed for making the handles of knives and forks, wooden spoons, and certain parts of musical instruments. It can even be utilised for the cogs of wheels in machinery.

Bear Skins. (Fr. *Peau d'ours*, Ger. *Bärenfell*, Sp. *Piel de oso.*)

The skins of the black bear, found in North America, are imported into this country to the extent of about 8,000 annually. They are used mainly for harness trimmings, hearthrugs, caps, etc. There is also a considerable trade in the skins of the white bear.

Beaver. (Fr. *Castor*, Ger. *Biber*, Sp. *Castor.*)

The skin of the *Castor cavadensis.* It is used for the manufacture of muffs, tippets, hats, etc. The animal is trapped in North America, and the imports into Great Britain amount to 200,000 skins every year. The secretion of the gland in the groin of male beavers has been valued for a long period on account of its curative properties.

Bebeerine. (Fr. *Bebere*, Ger. *Beberu*, Sp. *Bebero.*)

Or Beberine. An alkaloid which is obtained from the greenheart tree, or *bebeeru*, of British Guiana. It is identical with buxine, an alkaloid obtained from the bark and the leaves of the common box. It was at one time thought that bebeerine, in the form of a sulphate, would take the place of

quinine as a tonic and as a useful medicine in fever cases, but as it has proved to be less powerful than quinine its employment is not general.

Beche-de-Mer. (Fr., Ger., and Sp. *Beche-de-mer.*)

Or Trepang. This is a marine slug, found in the coral reefs of the Pacific. The commerce in beche-de-mer is confined almost entirely to the Chinese market, it being considered a great delicacy in China in making soups, etc. There are as many as thirty different varieties of trepang.

Bedda Nuts.

A species of myrobalan, though smaller and of a different shape to the true myrobalan. These nuts are imported in large quantities from the East Indies into the United Kingdom, and are useful in tanning. They are also employed by calico printers for obtaining a permanent black dye.

Beech. (Fr. *Hêtre*, Ger. *Buche*, Sp. *Haya.*)

The *Fagus sylvatica*, one of the common trees of Europe, cultivated on account of the usefulness of its wood for many domestic purposes. The wood is hard and solid, and because of its durability under water it is much in request for making mill sluices. Amongst the domestic articles which are manufactured from beech are chairs, tables, bedsteads, bowls, ladles, carpenters' planes, and other tools. It is also in great demand by wheelwrights and coachbuilders. On the continent sabots are manufactured out of beech. There are extensive forests of beech trees in Denmark. Its fruit is known as " mast," and is a favourite food for hogs. An oil is obtained from the mast which is used as a salad oil in Germany. Beech mast is commonly employed in the adulteration of cocoa. The ashes of beechwood yield potash, and vinegar is prepared from its shavings.

Beer. (Fr. *Bière*, Ger. *Bier*, Sp. *Cerveza.*)

The well-known fermented malt liquor—an article of extensive commerce both in the United Kingdom and on the continents of Europe and America. Although of considerable antiquity, the advance of science has made the present day production vastly different and very superior to the beer of a few centuries ago.

Various substances are used in the manufacture of beer—maize, rye, millet, and rice. But in Great Britain barley is the chief source from which it is produced. The two stages of its preparation are known as malting and brewing. In malting the barley is first steeped in water for a period varying from two to four days until a certain amount of moisture has been absorbed. The water is then drawn off and the grain is allowed to lie in a heap, during which time it becomes heated, absorbs oxygen, and gives off carbonic acid gas. Germination commences and in order to assist it the grain is spread out and constantly turned over. The length of time required for the requisite amount of germination varies with the heat applied, and when that amount has been reached kiln-drying takes place, that is, the grain is further spread out and additional heat supplied. The colour of the malt depends upon the process adopted, being either pale, amber, brown, or black. The first two kinds are used for the preparation of light beers, the brown for sweet ales, and the black for porter.

The subsequent processes are known as brewing. The malt is gently crushed, and afterwards mixed with hot water at a temperature of about 170° Fah. After standing for a few hours the infusion, or wort, is drawn off. This is known as mashing. Sometimes a second and a third mashing takes place. The malt left is known as draff or brewers' grains, and is used for feeding cattle. The wort is then boiled for two hours with a certain quantity of hops, the latter giving to the beer its bitter flavour, its tonic properties, and its keeping qualities. When the boiling is complete the liquid is cooled as rapidly as possible, and yeast is added for the purpose of fermentation. It is then that the greatest care is required, for if the fermentation is continued too long acetic acid may be formed. Fermentation is always stopped before it is complete, the yeast is carefully removed, and the resulting beer is drawn off into casks. A slow process of fermentation goes on in the casks, and this causes the beer to become stronger with lapse of time, and to be charged with carbonic acid gas.

The nutritive properties of beer depend upon the presence of sugar, dextrine, certain nitrogenous bodies, and soluble phosphates. It contains from 3 to 8 per cent. of alcohol. The percentages of alcohol in the following beers made in Great Britain are :—

Bass	8·4	Edinburgh ..	4·4
Burton	8·2	London Porter	4·1
Guinness ..	6·8	London Beer	3·9
		Lager Beer ..	3·2

Beeswax. (Fr. *Cire d'abeilles*, Ger. *Bienenwachs*, Sp. *Cera.*)

The hard fatty substance secreted by bees, and employed by them in forming the walls of their honeycombs. The wax is not merely the outcome of what is collected from plants, but it is a substance really elaborated within the bodies of the bees themselves. It is obtained from the combs of the bees after the honey has been removed. Naturally it is of a yellow colour, and has a sweet odour, but it is often bleached or whitened for use. It is an important article of commerce, and is largely imported from America and the East. Beeswax is employed in the manufacture of candles, and wax candles are still much prized for purposes of religious worship in spite of the existence of other illuminating fats. It is used in surgery and for many artistic purposes, especially for modelling fruits and flowers. The price of bleached beeswax is about £7 per cwt.

Beet. (Fr. *Bette, Betterave*, Ger. *Runkelrübe*, Sp. *Betarraga.*)

The plant which produces the tubers called beet-root. There are several varieties of the beet—yellow, red, and the common field beet. The Silesian beet is that which is most prized, as being the source of the most extensive manufacture of sugar. It has been estimated that one half of the sugar of the world is made from the Silesian beet.

Beetroot Sugar. (Fr. *Sucre de betterave*, Ger. *Runkelrüben zucker*, Sp. *Azúcar de betarragas.*)

The saccharine substance which exists in the juice of the beet to the extent of from seven to ten per cent. Beet-root sugar is identical with cane sugar. It was first manufactured in the eighteenth century, but it was not until the middle of the last century that the trade in it became of first class importance, and has since been so much fostered on the continent, especially in Germany. In the process of manufacture the roots of the beet are first steeped in water and reduced to a pulp. This pulp is then subjected to great hydraulic pressure. The juice obtained is afterwards heated up to 85° C., and milk of lime added to it. The mixture is raised to near boiling point and all albuminous constituents are thus removed by the presence of the lime. In order to remove other impurities and the colour the whole is subjected to filtration. The manufacture of beet-root sugar has been tried in England, but not on a scale commensurate with the adaptation of the English soil for the culture of the beet.

Beige. (Fr., Ger., and Sp. *Beige.*)

The French name for undyed serges, or woollen fabrics of a natural colour.

Belladonna. (Fr. *Belladone*, Ger. *Belladonna*, Sp. *Belladama.*)

A plant which has narcotic and poisonous berries, a native of Southern Europe. The extract of the plant is used medicinally for soothing irritation and pain, and by oculists for the purpose of dilating the pupil during an examination of the eye, and diminishing the sensibility of the retina to light. The activity of belladonna is owing to the presence of the alkaloid atropine.

Belts and Belting.

The flexible belts used for the transmission of motion in machinery. They are made of various substances, such as leather, india-rubber, cotton, woven hair, gutta percha, and canvas. They are of extensive use, and the manufacture is largely on the increase. According to statistics the breaking strains of the several kinds per square inch are as follows :—

Best leather	3,360 lbs.
Superior india-rubber . .	4,000 ,,
Stout stitched cotton . .	6,800 ,,
Solid woven cotton . .	10,420 ,,

Benedictine. (Fr., Ger., and Sp. *Benedictine.*)

A favourite liqueur made principally at Fécamp, in France. It has long been a formidable competitor of Chartreuse. It is a sweetened spirit, and, like other liqueurs, it owes its

peculiar taste and quality to the presence of various cordials and the essential oil derived from different kinds of herbs.

Benzoic Acid. (Fr. *Acide benzoïque*, Ger. *Benzoesäure*, Sp. *Acido benzóico.*)

Commonly known as gum Benjamin, an odoriferous or balsamic gum resin. It is the exudation from the stem of the *Styrax benzoin*, or *Styrax officinalis*, found chiefly in Siam and Sumatra. It is also prepared from the urine of graminivorous animals. It is of a yellowish or brownish colour, and always appears in the form of glistening feathery crystals. The chemical symbol for crystallized benzoic acid is C_6 H_5 COOH. It has varied uses in surgery and medicine.

Benzole. (Fr. *Benzole*, Ger. *Benzol*, Sp. *Benzole.*)

A liquid hydrocarbon, found in a tarry substance resulting from the distillation of oil. It is a volatile substance, lighter than water, of a peculiar aromatic odour. Its chemical symbol is C_6 H_6, and it boils at 80° C. It is prepared mainly from coal tar. It owes its importance to the fact that it is the spurce of aniline and the aniline colours. It is an excellent solvent of fats, resins, sulphur, phosphorus, and some alkaloids, and quickly removes grease spots.

Bergamot. (Fr. *Bergamote*, Ger. *Bergamotte*, Sp. *Bergamota.*)

An essential oil obtained by distillation from the rind of a fragrant species of orange—the *Citrus bergamia*. It is a colourless and thin liquid with a pleasant odour. Bergamot is extensively used in the preparation of pomades, fragrant essences, Eau de Cologne, liqueurs, etc. Palermo and Messina are the principal seats of its manufacture.

Beryl. (Fr. *Beryl*, Ger. *Beryll*, Sp. *Berilo.*)

A precious stone of a deep brown colour, or yellow with a reddish tint. It is closely allied to the emerald, but is not nearly so valuable, the difference consisting in the absence of the rich green colour which is so characteristic of the precious emerald. The finer varieties of the beryl, which are transparent and beautiful in colour, are known as aquamarine. The stone is found in various parts of Europe and occurs chiefly in veins that traverse granite or gneiss, or is embedded in granite.

Bessemer Steel. (Fr. *Acier Bessemer*, Ger. *Bessemerstahl*, Sp. *Accro Bessemer.*)

Steel made direct from cast iron by a process patented by Sir Henry Bessemer in 1856. It is prepared in England from hæmatite pig iron. The pig iron, in a molten state, is placed in a converter and subjected to a blast of air at high pressure. By means of this blast the whole of the original carbon is oxidised, and the requisite quantity is afterwards re-supplied by pouring in a measured quantity of *spiegeleisen*—a substance which also contains a small quantity of manganese and silicon. The steel is then run off into moulds, and subjected to various processes to make it useful in manufactures. Bessemer steel is employed in the manufacture of heavy articles, especially rails, tyres, rollers, boiler plates, ship plates, etc.

Betel. (Fr. *Bétel*, Ger. *Betel*, Sp. *Bétel.*)

The name given to the Areca Catechu palm, a tree which produces the betel nut, much used for chewing in the East. It is indigenous to the East Indian archipelago. The nut is capable of taking a fine polish when cut, and can be utilised in the manufacture of buttons; but it is mainly as a horse medicine that it finds a market in England. When calcined and pulverised it is sometimes employed as a tooth powder.

Bhang. (Fr., Ger., and Sp. *Bhang.*)

The Indian name for the flowering tops of hemp and hashish, though generally applied to the intoxicating preparation made from them. It is used as a sedative and a narcotic in medicine, but its great value in the East is mainly owing to the fact that the natives smoke bhang more freely than tobacco.

Bichromate.

(See *Chiomian.*)

Bird Skins. (Fr. *Peaux d'oiseaux*, Ger. *Vogelfelle*, Sp. *Piel de pajaro.*)

From all parts of the tropics there is a large importation of bird skins to Europe for the decoration of hats and bonnets. It is estimated that the number of skins of small birds imported amounts to more than one

million annually. Humming birds are the most common, though tanagers —American birds of the finch and sparrow species—of various kinds are scarcely less numerous. Birds of paradise and Impeyan pheasants from the East Indies afford a considerable trade. (See *Feathers.*)

Biscuits. (Fr. *Biscuit*, Ger. *Zwieback*, Sp. *Bizcocho.*)

French, "twice-baked." Hard baked cakes of unfermented flour. Biscuit making has become an important industry of itself, and large factories are erected in various parts of the kingdom for the manufacture of them. The varieties of biscuits are very great, and improvements are being continually made in their preparation. Meat biscuits are of American origin and seemed likely at one time to command a large market. Owing to the perfecting of the preservation of animal food they have fallen into disuse. The "perfect food biscuit" is a late invention and consists of a cake into the composition of which the chemical elements needed for a perfect diet enter.

Bismuth. (Fr., Ger., and Sp., *Bismuth.*)

A reddish white, soft, crystalline metal, often known by the name of "tin glass." It has a specific gravity of 9·8, and melts at 264° C. Bismuth is found in a native state in Cornwall, France, Peru, Siberia, and very plentifully in Saxony. It unites very readily with other metals to form alloys, and these alloys are of the greatest value in the arts. The best known is called fusible metal, and consists of 2 parts of bismuth, 1 of lead, and 1 of tin. Spoons are made of this alloy. By the addition of mercury a still more fusible metal is obtained, which is used in making moulds for toilet soaps and taking casts. Trioxide of bismuth is employed in porcelain manufacture for the purpose of fixing the gilding. In medicine bismuth is valuable as a sedative.

Bitters. (Fr. *Amers*, Ger. *Bitter*, Sp. *Amargo.*)

Popular medicines useful as tonics. They are prepared by infusing some vegetable substance containing a bitter principle in water, and afterwards straining the infusion. Rectified spirit is then added to prevent the bitters becoming putrid. Bitters are good as appetisers and for giving tone to the system. The best known are Angostura, Quassia, Gentian, and Orange.

Bitumen. (Fr. *Bitume*, Ger. *Erdpech*, Sp. *Betun.*)

Mineral pitch obtained from France, Italy, Holland, and Trinidad. Common pitch is often mixed with sand and then used as a substitute. Supposed to be of vegetable origin, bitumen possesses a strong and peculiar odour, and is highly inflammable. Under the name of bitumen are included a series of widely different substances from naphtha to glassy asphalt.

Bituminous Coal. (Fr. *Charbon bitumineux*, Ger. *Harzig-kohle*, Sp. *Carbon bituminoso.*)

The name given to coal which burns brightly owing to the presence of an excessive quantity of organic, volatile, or resinous matter. It is chiefly valuable on account of the volume of pure gas obtained from it in distillation.

Blacking. (Fr. *Cirage*, Ger. *Stiefelwichse*, Sp. *Betun.*)

The material used for polishing black leather, and giving it a glazed shining surface. Different manufacturers use different articles in the composition of their blacking, but the main ingredients are bone-black, and a mixture of oil, sugar, and sulphuric acid. A tenacious paste is obtained, and this paste may be kept in tins or stone-ware bottles, the latter being used when the paste is made thinner by the addition of a little vinegar. For cleaning harness a different composition is employed, composed in the main of beeswax softened with turpen, tine, and then mixed with ivory black-Prussian blue, and copal varnish.

Blacklead. (Fr. *Graphite*, Ger. *Graphit*, Sp. *Grafito.*)

Graphite, or Plumbago. Though black lead is the popular name, no lead enters into the composition of this mineral. It is one of the forms in which carbon occurs native. It is of a grayish-black colour with a metallic lead-like lustre and a greasy touch. Blacklead is found in many parts of the world, especially Ceylon, Siberia, Bohemia, and Bavaria, but some of the best is obtained in

Cumberland. The last is valuable, on account of its fine grain, in the manufacture of lead pencils. Blacklead is also used for the manufacture of crucibles, for giving a polished surface to cast-iron, and for counteracting friction.

Bladders. (Fr. *Vessies, Vésicules*, Ger. *Blasen*, Sp. *Vejigas.*)

The hollow bags of animals for the reception of urine. When they are cleaned they are used as receptacles for lard and other similar substances. Great Britain imports immense numbers of bladders in a salted state from the continent of Europe and also from America.

Blankets. (Fr. *Couvertures*, Ger. *Woilene decken*, Sp. *Mantas.*)

Wrappers or covers, especially for beds. The best qualities of blankets are made entirely of wool, though the most common English ones are a mixture of wool and cotton—woollen weft and cotton warp—the cotton giving strength to the whole. The best-known varieties of English blankets are Witney, Kersey, Yorkshire, and Bath. Dewsbury is the principal centre of the Yorkshire trade. Scotch blankets are considered to be much more economical than those manufactured in England. Superior kinds are made in the United States and fetch high prices, and still more delicate specimens are produced at Mysore.

Bleaching Powder. (Fr. *Chloride de calcium*, Ger. *Calcium chlorid, Chlorcalcium*, Sp. *Cloruro de calcio.*)

Chloride of lime, valuable and very important as a disinfectant and also as a bleaching agent. It is a greyish-white powder, and has a strong odour resembling that of chlorine. It is generally prepared by passing chlorine over layers of slaked time till the gas is no longer absorbed. The manufacture of bleaching powder is one of the leading chemical industries of Great Britain. Its principal commercial importance consists in its use for bleaching paper and linen. It is also much employed in the manufacture of chloroform.

Blende. (Fr. *Blende*, Ger. *Blende*, Sp. *Blenda, Sulfureto de Zinck.*)

The native sulphide of zinc, and valuable as the ore from which zinc is obtained. Though the name should really be confined to zinc sulphide, it is often given to various other minerals when found combined with sulphur. Its ordinary black colour is due to the presence of iron, and on that account English miners call it "Black Jack." Blende is found in England, and in various parts of the globe.

Blind Coal.

A popular name for anthracite.

Blister Steel. (Fr. *Acier poule*, Ger. *Blasenstahl*, Sp. *Acero de cementacion.*)

A peculiar variety of steel of a fine granulated texture, and marked on the exterior with blister-like prominences. It is formed in a furnace in the process of converting bar-iron into steel. It is particularly useful for making files and tools of various descriptions.

Block Tin. (Fr. *Étain commun*, Ger. *Blockzinn*, Sp. *Tejo, Pedazo de estaño puro.*)

An alloy of tin containing, in addition to tin, a mixture of iron, copper, lead, arsenic, and antimony. This alloy is what remains after crude tin has been heated in a furnace, and the pure or grain tin has fused and run off.

Blubber. (Fr. *Lard de baleine*, Ger. *Wallfischfett*, Sp. *Grasa de ballena.*)

The fat of whales and other marine animals, but the name is often applied to the membrane in which the oil or fat is inclosed before it is boiled down to extract the train oil.

Blue. (Fr. *Bleu, azur*, Ger. *Bläuel*, Sp. *Pala.*)

The colour used either for purposes of dyeing, or for tinting paper. As a powder it is commonly used by laundresses. Formerly blue was made by a mixture of various chemical compounds, but it is now derived from coal tar as one of the aniline colours.

Blue Stone. (Fr. *Vitriol de cuivre*, Ger. *Blaustein*, Sp. *Piedra azul.*)

This is the name by which sulphate of copper is known in commerce. It is prepared from copper pyrites.

Boards. (Fr. *Planches*, Ger. *Bretter*, Sp. *Tablas.*)

When timber is sawn there is a considerable difference in its thickness. If the thickness is less than nine inches the pieces are known as boards; above that thickness they are called planks.

Bole. (Fr. *Bol, terre bolaire*, Ger. *Bolus*, Sp. *Bol arménico.*)

A variety of clay, coloured red, yellow, or brown, according to the quantity of iron present. Its most common constituents are ferric oxide combined with a certain quantity of silica, alumina, and water. It is found in various parts of the world, but chiefly in Saxony, Bohemia, Silesia, Styria, and Italy. Bole itself is not a well-defined mineral, and the name has been given to various substances. Armenian bole is of a fine, bright, red colour; bole of Blois is yellowish, and contains carbonate of lime, whilst French bole is of a pale red colour with streaks of yellow. Bole was formerly employed as a tonic, and its medicinal properties were due to the quantity of oxide of iron present in it. It is sometimes used in the manufacture of tooth powder, but its chief use at the present time is for adulterating various articles of food, such as anchovies and cocoa, which have naturally a reddish colour.

Bombazine. (Fr. *Alépine*, Ger. *Bombasin*, Sp. *Bombasi.*)

A mixed fabric of silk and worsted, the warp being silk and the weft worsted. It is generally dyed black. In make it is very fine and light. At one time bombazine was used for mourning, but of recent years it has not been much worn. The chief seat of its manufacture was and is Norwich.

Bone Black. (Fr. *Charbon, noir animal*, Ger. *Knochenkohle*, Sp. *Carbono.*)

The product obtained from the destructive distillation of bones. It consists chiefly of phosphate of lime mixed with the carbon of the organic matter of the bones. The bone black is obtained by exposing bones placed in covered pots to a red heat in a furnace or kiln for some hours. It is valuable in commerce owing to its remarkable property of removing colouring matter from solutions of organic compounds. For this reason it is largely employed by sugar refiners. It is also used as a deoderiser owing to its power of absorbing gases. When thoroughly ground and mixed into a paste with water and afterwards dried, bone black is employed as a pigment called "ivory black."

Bone Earth. (Fr. *Phosphate de chaux*, Ger. *Knochenasche*, Sp. *Ceniza.*)

Or bone ash. The mineral matter remaining after the combustion of bones. It contains from 70 to 80 per cent. of calcium phosphate. It is useful for polishing plate and other articles, but it is mainly employed as a constituent of various manures. Bone earth is extensively imported into the United Kingdom from South America.

Boracic Acid. (Fr. *Acide borique*, Ger. *Boraxsäure*, Sp. *Acido boracico.*)

A saline product obtained by various processes from certain lagoons in Tuscany. The annual product is nearly three million pounds in weight. Boracic acid is employed in the preparation of certain kinds of glass, and also as an antiseptic dressing for wounds. Its chief use, however, is in the making of borax.

Borax. (Fr. *Borax*, Ger. *Borax*, Sp. *Atincar, Borax.*)

A compound of boracic acid and soda, colourless and crystalline. It was formerly imported in its crude state from India, but it also occurs native in various parts of South America. At the present time, however, borax is mainly obtained from boracic acid. Its chemical symbol is $Na_2\ B_4\ O_7$. To the chemist it is valuable as a blow-pipe re-agent, and in the arts and manufactures it is used for glazing glass, enamel, and porcelain, as a mordant in calico printing, and as an ingredient of various toilet articles. Lately it has been much employed in the preservation of meats, etc.

Bort. (Fr. *Egrisée*, Ger. *Diamantenstaub*, Sp. *Polvo diamantino.*)

The name given to certain dark lustreless diamonds found in Brazilian mines, also known as anthracite diamonds. As they possess the hardness of the precious stone, they are used for diamond rock-boring drills, and are also employed by lapidaries in stone cutting.

Boxwood. (Fr. *Bois de buis*, Ger. *Buchsbaumholz*, Sp. *Madera de boj.*)

The wood of the box tree, which is now cultivated in many parts of Europe and Asia. The best kind is obtained from Turkey in Asia and Persia, the product of the *buxus balearica.* The wood is fine-grained, smooth, and remarkably hard and

strong. It has a yellowish colour and is capable of taking a beautiful polish. Not only is it much in request by the wood engraver and the turner, but it is extremely valuable in the manufacture of musical and mathematical instruments.

Bran. (Fr. *Son*, Ger. *Kleie*, Sp. *Salvado.*)

The outer covering or husk of wheat which is obtained after the grain has been ground and sifted. In commerce it is generally found in thin, scaly particles of a yellowish brown colour. Its percentage composition is as follows: starch, 44; lignose and cellulose, 17; fibrin, 15; water, 14; ash, 6; and fat, 4. Though rich in nitrogen, it has but slight nutritive properties, but as it has the power of converting starch into sugar very quickly, bran is largely used in making digestive bread. It is most commonly employed as a food for cows and pigs, and in making mash for horses. Calico printers use it for the purpose of removing colouring matter from those parts of the cloth where it has not been fixed in the fabric by a mordant. In the practice of medicine bran is a valuable medium for the external application of heat.

Brandy. (Fr. *Eau de vie*, Ger. *Branntwein*, Sp. *Aguardiente*).

The well known and important alcoholic liquid spirit, distilled from wine, especially in France and Germany. It is sometimes known as cognac and fine champagne. The best qualities are generally distilled from the white wines, and the inferior qualities from the red. When originally distilled, brandy is clear and colourless, and remains so if it is kept in glass vessels. If, however, it is preserved in casks the spirit dissolves the colouring matter in the wood, and becomes yellowish. The brown-coloured brandy is obtained by the addition of caramel or burnt sugar. The peculiar flavour and aroma are caused by the presence of small quantities of various ethers. The best brandies are made in the country near Cognac, in Charente. Brandy is prepared in England from grain spirit, which is flavoured to imitate cognac by the addition of Hungarian oil or œnanthic ether. On the continent there is another preparation derived from potato spirit, and this is extremely injurious owing to the presence of fusel oil. Latterly the beet has been utilised for making brandy. The Germans apply the name *Branntwein* to all kinds of grain spirit, or spirit distilled from various fruits—*kirschbranntwein* or *kirschwasser* is derived from cherries and their kernels. In England cherry brandy is brandy in which cherries have been steeped and preserved. The United States manufacture large quantities of spurious brandies which are exported to France and then re-exported.

Brass. (Fr. *Airain*, Ger. *Gelb-kupfer, Messingbraht*, Sp. *Alambre.*)

A valuable alloy of copper and zinc, of a more or less yellow colour. In addition, the alloy frequently contains small quantities of iron, tin, or lead. But the name brass has now come to have a wider meaning and includes not only bronze, but alloys of copper and lead. Brass is manufactured by combining the copper and zinc directly, the proportions in the commonest cases being 64 of the former metal and 36 of the latter. Its specific gravity is 8.3. It is easily fusible, very malleable, and exceedingly ductile, and can be readily cast into moulds, or rolled or hammered into any shape required. Its uses are very numerous, and the head-quarters of the brass industry is Birmingham.

Special names are given to certain alloys of the brass kind. The principal of these are Muntz metal and Gedge's metal, which are used for sheathing ships. The hardest of all the alloys is called Sterro metal, which is composed of 55 parts of copper, 42.4 of zinc, 0.8 of tin, and 1.8 of iron.

Brattice Cloth.

The name given to strong tarred cloth or canvas, used in mines and underground workings as partitions and for promoting ventilation.

Brazil Nuts. (Fr. *Noix de Brésil*, Ger. *Brasiliennusse*, Sp. *Nuez de Brasil.*)

The well known edible seeds of the *bertholettia excelsa*, a majestic tree which grows extensively in the forests on the banks of the Orinoco, and in tropical America generally. The

seeds, or nuts, are enclosed in a hard case. The nuts are exported from Para in Brazil, and also from French Guiana. Besides being used as a food, Brazil nuts provide a valuable oil which is esteemed in cooking and is sometimes employed by watchmakers and artists.

Brazil Wood. (Fr. *Bois de Brésil*, Ger. *Brasilien-holz*, Sp. *Madera de Brasil.*)

The dye-wood obtained principally from the *Caesalpinia Echinata* of the West Indies, though a similar kind of wood is obtained from Brazil, and another, sometimes called Saffron wood, from the East Indies. When cut the wood is yellowish in colour, but it soon assumes a deep red tint after it has been exposed to the air. The wood itself is very hard and heavy. A dyeing solution is obtained by reducing the wood to powder in a mill, and extracting the colouring matter by the action of boiling water. The dye imparts a bright crimson colour to wools and silks, but the colour is not a permanent one. The solution is also used in the manufacture of red ink.

Briar Root. (Fr. *Racine de ronce*, Ger. *Hagebuttenwurzel*, Sp. *Raiz de escaramujo.*)

The roots of a climbing plant found in North America—*Smilax rotundifolia.* The wood is fine and hard, and its use is almost confined to the manufacture of bowls for tobacco pipes, of which several millions are turned out annually. Latterly the laurel root has been largely substituted for the briar root. Briar roots are also imported into England from the Pyrenees, from Corsica, and from Algeria. These last are, however, the roots of a species of heath—*erica arborea.*

Bricks. (Fr. *Briques*, Ger. *Ziegel stein*, Sp. *Ladrillos.*)

Masses of baked earth or clay, moulded into regular shapes, and used for building purposes. The materials employed are ordinary clay, loam or sandy clay, and marl or clay containing a certain quantity of lime. These substances are carefully mixed together, and the whole baked in kilns. Although manufacture by hand is still largely carried on, bricks are now made in immense quantities by machinery. They differ considerably in quality and in their properties according to the districts in which they are manufactured, and the purposes for which they are required. The most ordinary distinction, however, is between common and fire bricks, the latter, as being required to withstand high temperatures, having as little lime and magnesia in their composition as possible. The general size of bricks is 9 inches long, 4½ inches broad, and 3 inches thick. Hard burnt bricks, used for paving yards and stables, and in size 6 by 3 by 1 inches, are imported from Holland and known as Dutch bricks.

Brick Tea. (Fr. *Thé en briques*, Ger. *Tartarenthee*, Sp. *Té de Tibet.*)

The name given to tea which is compressed into blocks or slabs. There is a large trade in this tea between China and Russia, but the article does not enter into English commerce.

Brie. (Fr., Ger., and Sp., *Brie.*)

The name of a fancy cheese manufactured on the continent, and particularly in France. It has a rough exterior, and has the appearance of an ordinary pancake. The price of bric is very cheap. It is consumed very largely on the continent, and the export trade in the article from France to England is also considerable.

Brill. (Fr. *Turbot*, Ger. *Heiligbutte*, Sp. *Mero.*)

A sea fish of the same species as the turbot, for which it is often substituted, and a characteristic British food. It is neither so delicate nor so firm as the turbot, and it is seldom of more than 8 lbs. in weight. It is caught in large numbers off the shores of England and Wales, as well as off the coasts of northern European countries.

Brimstone. (Fr. *Soufre*, Ger. *Schwefel*, Sp. *Azufre.*)

The commercial name of sulphur, when made into sticks or rolls. (See *Sulphur.*)

Briquette. (Fr., Ger., and Sp., *Briquette.*)

Masses of artificial fuel shaped like common building bricks, though generally double their size, and weighing about 10 lbs. each. Briquettes are made of small coal combined with a certain proportion of pitch. The coal

is first cleaned, and the combination with pitch is effected in what are known as "pug mills." The chief value of the briquette lies in its smouldering qualities, which make it particularly useful for household purposes, and the heat given out is equal to that of coal. In burning there is hardly any smell. Latterly this form of fuel has been used for heating the boilers of locomotives and marine engines, and it is now also employed for puddling furnaces. France, the original seat of the manufacture, still turns out briquettes in greater numbers than any other country.

Bristles. (Fr. *Soies*, Ger. *Schweinsborsten*, Sp. *Cerdas, Setas.*)

The stiff hairs of various mammals, especially those of the wild boar and the hog. Bristles are imported in enormous quantities into England for the purpose of brush-making, and they are also used by shoemakers and saddlers. France, Germany, Holland, Belgium, and China do a large trade in this commodity, but the best and most valuable come from Russia in Europe, and from Siberia. The supplies obtained from the United States are increasing year by year. The value of bristles varies from £8 to £60 per cwt.

Britannia Metal (Fr. *Britannia metal, Métal anglais*, Ger. *Englischermetall*, Sp. *Metal ingles.*)

An alloy of a silver-white colour composed of tin, copper, zinc, antimony and bismuth (and sometimes lead) in varying proportions. It is a composition which lends itself easily to what is known as "metal spinning," and has long been employed for the manufacture of jugs, pots, covers, dishes, spoons, etc. It forms a good ground for electro-plating with silver, and is therefore in great demand in Birmingham and Sheffield.

Broad Cloths.

A fine kind of woollen fulled cloth used for men's garments. It is manufactured in lengths with a width of about 30 inches.

Brocade. (Fr. *Brocart*, Ger. *Procat*, Sp. *Brocado.*)

A species of embroidered silk stuff, raised and enriched by flowers and figures, and into which gold or silver thread is often woven. Modern brocades are frequently manufactured without the gold or silver thread. Originally a Chinese manufacture, the trade in brocade has passed to Europe, and especially France. Brocades are now mainly used as upholstery cloths for furniture and hangings.

Broccoli. (Fr. *Brocoli*, Ger. *Italienischer-Kohl*, Sp. *Bróculis.*)

The well-known garden vegetable, a variety of cabbage. It resembles the cauliflower in many respects, but differs from it in having a coloured instead of a white head, and also in having leaves of a deeper tinge. It is also hardier in its constitution, and can withstand all but the most severe winters. The trade in broccoli is very extensive in the early parts of the year, and the main supplies are derived from the district round Penzance.

Bromine. (Fr. *Brôme*, Ger. *Brom*, Sp. *Bromo.*)

The only chemical element, except mercury, which is liquid at the ordinary temperature. It is obtained from sea water and kelp, though it is also found in certain springs, especially at Kreuznach and Kissingen, in Germany. Its specific gravity is 2.9, and it boils at a temperature of 58° C. Bromine is a heavy red liquid, possessing a peculiar and disagreeable smell, and is an irritating and corrosive poison. It combines readily with all the elements, and has a special affinity for hydrogen. Many of its compounds are valuable in the arts, and bromide of silver is in great request in photography. Its most important use is in medicine, in the form of bromide of potassium, as it acts as a sedative.

Bronze. (Fr. *Bronze*, Ger. *Bronze*, Sp. *Bronce.*)

Under the name of bronze all alloys of copper and tin are generally included, not only the bronze used for ornaments and coins, but also such substances as gun metal, bell metal, and speculum metal. The colour and the properties of this valuable composition differ according to the proportions of the copper and tin introduced into its manufacture. It is extensively used in the arts and manufactures, and is particularly valuable for castings. A peculiar kind of bronze is known as phosphor bronze, in which the copper is mixed with tin phosphide, instead of the ordinary

metal. The compound thus obtained is more homogeneous, much harder, and of greater tenacity than common bronze, and is best suited for engineering and mechanical works.

Broom Corn.

A species of grass, now largely cultivated in North America, especially in the United States, for the sake of the tops of its stems and branches, which are made into whisks and brooms. The area under cultivation in the United States is constantly increasing, and the annual value of the exports to England exceeds £40,000.

Brushes. (Fr. *Brosses*, Ger. *Bürsten*, Sp. *Cepillos*, *Bruzas.*)

Among the commonest of domestic articles. The manufacture is one of considerable magnitude, and is exceedingly widespread. The materials used are very varied; some are of animal origin, as hog's bristles, and the hair of numerous animals, others are of vegetable origin, as the fibre of the aloe, the cocoanut, esparto grass, and the like, and there are also brushes of steel and brass wire for particular purposes. All kinds of wood, ivory, tortoise-shell, and metals are used for the backs and handles. Brushes are now mainly made by machinery, hardly a single process being carried out by hand.

Brussels Sprouts. (Fr. *Choux de Bruxelles*, Ger. *Kohlsprossen*, Sp. *Bretones.*)

A hardy winter vegetable, belonging to the same class as the cabbage. The sprouts are in the shape of small cabbages, which are composed of clusters of leaves. The cultivation of the vegetable is carried on chiefly in the district near Brussels, and large quantities are imported into the United Kingdom from Belgium. It is generally supposed that the Brussels sprouts cultivated in the United Kingdom are much inferior in quality to those grown on the continent.

Buckskin. (Fr. *Cuir de bélier*, Ger. *Bocksfell*, *Buckskin*, Sp. *Piel de cabra.*)

The tanned skin of goats, sheep, and deer. The name is also given to a species of strong, twilled, woollen cloth, used for trouserings.

Buckwheat. (Fr. *Sarrasin*, *Blé noir*, Ger. *Buckweizen*, *Heidekorn*, Sp. *Alforfon.*)

The seed of the *Fagopyrum esculentum*. It is largely grown on the continent and in the United States, but only to a slight extent in England. Here it is of little use except for feeding pheasants, but in other parts of the world it forms a food stuff, and is said to be exceedingly nutritious, superior to rice, and only slightly inferior to wheat. Beer is made from it, and it is not unknown in gin distilleries. The husks are sometimes used as a packing material.

Buffalo Horns. (Fr. *Cornes de buffle*, Ger. *Büffel-horner*, Sp. *Cuernos de búfalo.*)

The black and heavy horns of the Indian buffalo, largely imported from India for making combs.

Buff Leather. (Fr. *Buffle*, Ger. *Büffelleder*, Sp. *Cuero de búfalo.*)

Strong oiled leather, made from the salted and dried hides of South American oxen. It is prepared by a process of oiling, without the use of any tanning material. The colour is given to it by dipping the hides in an infusion of oak bark. The leather is strong and durable, and at the same time pliant, and not liable to crack or rot. It is largely used for manufacturing purposes, especially in the making of army belts, etc.

Butter. (Fr. *Beurre*, Ger. *Butter*, Sp. *Manteca.*)

The solid fat which is obtained from the milk of all mammals. For commercial purposes, however, the only butter which is met with is that made from the milk of cows. The fat is contained in very small globules in new milk, enclosed in a thin sac or membrane, and these globules rise to the surface as cream. Generally the cream is removed and subjected to a prolonged agitation in a churn. This agitation ruptures the membranes and the particles of fat coalesce. Sometimes a little hot water is added to the cream, or the churn is placed in a hot-water bath. The fat is then kneaded and pressed, and butter is the result. Butter is also prepared from new milk itself before the cream has been separated. The chief principles of butter are stearine, margarine, and olein, together with small portions of casein, and butyric and caproic acids, the last mentioned giving the peculiar

aroma and taste. The colour is either white or yellow, depending upon the quality of the milk and cream used, which quality varies with the feeding of the cows and the districts in which the butter is prepared. Sometimes, and especially for inferior kinds of butter, arnotto is employed as a colouring matter. Owing to the fermentation of the nitrogenous casein, butter quickly becomes rancid unless it is salted. The salting is best done by using a mixture of nitre, sugar, and salt. Adulteration is common, lard, flour or potato starch, and other substances being mixed up with it. To increase its weight water is often added.

There is an extensive trade carried on in this article. England is, in proportion to its population, the greatest consumer of butter in the world, and in addition to that which is home-made thousands of tons are annually imported from France, Denmark, Holland, and the United States. Ireland not only supplies the wants of its own population, but also exports a considerable quantity.

Butterine is a mixture of animal fats with a certain amount of butter added. When well made it is not easy to distinguish butterine from good butter, except by chemical analysis. It is sold as margarine. To prevent the frequent imposition practised by selling butterine as butter, an Act of Parliament was passed in 1887 regulating the sale of this article. It is chiefly imported from Holland.

Buttermilk is the residue after the cream or new milk has been churned in the preparation of butter. Although the main portion of the fatty substances in the milk has been removed, the liquid which remains is a very nutritious, healthy, and digestive beverage. It is largely drunk in the country districts of England, but more so in Scotland and Ireland. It possesses a slightly acid taste which has been developed in the churning of the cream.

Button. (Fr. *Bouton*, Ger. *Knopf*, Sp. *Boton.*)

Buttons used as a fastening or an ornamentation, have been employed for ages. They are made from varieties of materials, and by various processes. The principal kinds are (1) pearl and other turned buttons, (2) metal buttons, (3) covered buttons, and (4) fancy buttons. The chief seats of manufacture are Birmingham, Paris, Lyons, Vienna, and several German towns. German competition is seriously affecting the manufacture in other countries. In the United States the manufacture of buttons is carried on at New York and Philadelphia.

Butyric Ether. (Fr. *Ether butyrique*, Ger. *Butteräther*, Sp. *Eter mantecoso.*)

A compound formed by the action of butyric acid on alcohols, but for commercial purposes it can be made from butter. The butter is mixed with potash, the compound dissolved in alcohol, and afterwards distilled with sulphuric acid. Its chemical symbol is $C_4H_5C_4H_7O_2$. Butyric Ether possesses the flavour of pine-apples, and it is sold as Pine-apple Oil. It is largely used in flavouring sweets and other confections, and in the manufacture of Pine-Apple Ale. It is also employed very largely in the preparation of compound perfumes.

Cabbage. (Fr. *Chou*, Ger. *Kohl*, Sp. *Berza, Col.*)

The well-known plant cultivated both for culinary purposes and for feeding cattle, not only in Great Britain but in nearly every temperate region of the world. By careful cultivation in good and well manured soils a supply can be obtained all the year round. Although extremely pleasant in most forms cabbage is not a very nutritious food, every variety, of which there are numerous, containing nearly 90 per cent. of water. The principal species are the Savoy, Cauliflower, Brussels Sprouts, and Broccoli. Red cabbage is a distinct variety, chiefly remarkable for the reddish purple colour of its leaves. It is chiefly used for pickling. In Germany salted cabbage, or sauer kraut, is highly esteemed.

Cable. (Fr. *Cable*, Ger. *Kabel*, *Schiffstau*, Sp. *Cable.*)

A large rope or a chain of iron links, chiefly employed on ships for the purpose of suspending or retaining anchors. Rope cables are made of the best hemp, carefully twisted with the utmost compactness to give the greatest possible strength. They vary in thickness according to requirements. Recently wire rope has been coming into common use as a substitute for hemp

cables, especially for towing purposes. The wires used are generally twisted round a hempen core, and have been galvanized beforehand. Hemp and wire will probably soon give place almost entirely to chain cables. These are made of oval welded links, manufactured from wrought iron, each link being fitted with a cross piece, or as it is commonly called a stud, to prevent the sides being drawn together by the pull exerted upon the link. By law all chain cables are required to be tested before being used. The length of a hemp cable is 120 fathoms, that of a chain cable 100 fathoms.

The name is also applied technically to the metallic core and its insulating surrounding used in oceanic telegraphy.

Cadmium. (Fr. *Cadmium*, Ger. *Cadmium*, Sp. *Cadmio.*)

A white metal occurring in small quantities in certain ores of zinc. In appearance it bears a strong resemblance to tin, but is much harder. Soft, malleable, and ductile at ordinary temperatures it is easily melted and tarnishes but slightly. When strongly heated it burns. Its specific gravity is 8.6. Though cadmium is not itself used as a metal, several of its compounds are valuable in medicine and in the arts. Iodide and bromide of cadmium are employed in photography, and sulphide of cadmium (generally known as cadmium yellow) is of great value to the artist.

Caffeine. (Fr. *Caféine*, Ger. *Caffeïn, Kaffeestoff*, Sp. *Cafeina.*)

Or Theïne. An alkaloid, the active principle in coffee, tea, *maté*, or Paraguayan tea, guarana, and other plants. It is strongest in coffee, which contains 8 per cent., whereas tea has only a little over 2 per cent. When isolated, caffeïne forms beautiful white crystals with silky lustre, which are soluble in water, ether, and alcohol. It is extracted either from coffee or tea by making a decoction in hot water and adding acetate of lead. The taste is extremely bitter. Latterly it has been used medicinally as a powerful stimulant of the heart's action, whilst citrate of caffeïne is given for the relief of sick headache. Its chemical symbol is $C_8H_{10}N_4O_2H_2O$. It is the presence of caffeïne which makes tea and coffee valuable as articles of diet.

Cajeput. (Fr. *Cajeput*, Ger. *Cajeput*, Sp. *Cayeput.*)

A tree of the myrtle order, *Melaleuca Minór*, which grows in the East Indies. It is valuable on account of its leaves, from which an aromatic, volatile oil, called Cajeput oil, is obtained by distillation. The colour of the oil is green, which is partly owing to the presence of small quantities of copper. It is closely akin to eucalyptus oil. In the East Cajeput oil is used as a kind of universal remedy. In Europe it is employed medicinally as a stimulant and diaphoretic.

The name Cajeput is sometimes given to a Californian tree, *Umbellularia Californica*, the wood of which is valuable for the manufacture of cabinets.

Calambac. (Fr. *Calambac*, Ger. *Calambak*, Sp. *Calambac.*)

The *Alœxylon Agallochum*, a tree of Mexico. The wood of the tree is extremely odoriferous, and is much employed in perfumery.

Calcium. (Fr. *Calcium*, Ger. *Calcium*, Sp. *Calcio.*)

The metal present in chalk, stucco, and various compounds of lime. It is very widely distributed throughout the globe, though never found pure. It can be most easily prepared by passing an electric current through fused chloride of calcium, the metal then separating from the compound. Calcium is pale yellow in colour, and can be rolled or hammered into very thin sheets or plates. Its specific gravity is 1.578. Though of no commercial use alone, the compounds of calcium are very valuable. The oxide forms lime, and when water is added slaked lime. The sulphide is employed in the manufacture of luminous paint, whilst the sulphate is the chief constituent of gypsum.

Calomel. (Fr. *Protochlorure de mercure*, Ger. *Kalomel*, Sp. *Calomel.*)

Known also as mild muriate of mercury, and subchloride of mercury. Calomel is the popular name of this compound of mercury and chlorine. It is prepared in various ways, the simplest being by heating sulphate of mercury with metallic mercury and common salt: The calomel is separated by sublimation, and sulphate of soda remains. It is a white powder,

insoluble in water and only slightly soluble in acids. It is the most valuable of the mercurial preparations used in medicine.

Camomile. (Fr. *Camomille*, Ger. *Kamille*, Sp. *Magarza.*)

A genus of plant belonging to the family *Compositae.* There are several species found in England, and some of these are valuable in medicine as tonics and stomachics, the best of all being known as the *Anthemis nobilis* which is cultivated at Mitcham, in Surrey. Its medicinal properties are owing to the presence of an essential oil which is obtained by distillation. Camomile is sometimes used fraudulently and illegally instead of hops in the brewing of ale.

Camphor. (Fr. *Camphre*, Ger. *Kampher*, Sp. *Alcanfor.*)

A solid essential oil found in many plants, but extracted for commercial purposes from a kind of laurel (*cinnamomum camphora*) which abounds in China and Japan, and which has been introduced into Java and also into the West Indies. To obtain the camphor the wood of the tree is cut into small pieces and boiled in water, the camphor rises with the steam and condenses at the top of the vessel. In its rough state it is exported to Europe, where it is again purified and refined by heating and condensing the vapour. When pure, camphor is a white, soft, semi-transparent body, with a peculiarly strong aromatic odour, and a bitter burning taste. It is slightly lighter than water and only dissolves in that liquid to a very small extent, forming camphor water. It is however, readily soluble in alcohol, ether, acetic acid, and essential oils. Inflammable, it burns with a white smoky flame. The wood of the camphor tree, as it is sometimes called, is valued by the cabinet maker.

The chemical symbol of camphor is $C_{10}H_{16}O$. Its medicinal properties have long been known, and it is used for external application as well as internally for various complaints. Owing to its strong odour it is employed in the preservation of natural history specimens for driving off insects. The fumes of camphor have long been recognised as of great antiseptic value.

Canada Balsam. (Fr. *Baume du Canada*, Ger. *Canada-Balsam*, Sp. *Arbol de Canade.*)

This is not really a balsam at all, but a kind of turpentine which is obtained from the *pinus balsamea*, a native of Canada and the northern parts of the United States. It is contained in receptacles between the bark and the wood, and flows out when an incision is made in the tree. Its colour is pale yellow, its odour agreeable, and its taste bitter. After a slight exposure it becomes solid. It consists mainly of resin and about 20 per cent. of a volatile oil. Its medicinal value is no longer recognised, but it is much used in the arts, for making varnishes, for mounting objects for the microscope, and by opticians for cementing glasses. Its value for the last mentioned purpose is particularly great, as the balsam is perfectly transparent and the refractive power which it possesses is nearly equal to that of glass.

Canary. (Fr. *Serin*, Ger. *Canarienvogel*, Sp. *Canario.*)

The well-known cage bird. It breeds freely in England, but there is a large annual importation of canaries from the continent, though it is impossible to ascertain the number. The bird is found in Madeira and the Canary Islands, but it is in the Tyrol that a particular business has been made of the breeding. Of those reared in England the hardiest varieties are the Norwich, and the largest the Lancashire Coppies. By means of variations in feeding, artificial changes in colour may be effected. The ordinary food for canaries is canary seed, the small seeds of the *phalaris canariensis*, imported from Spain, Portugal, and Morocco, though a good kind is obtained from Turkey. Canary seed is also used for the preparation of a fine flour which is valuable in finishing silk fabrics.

Candle. (Fr. *Chandelle, Bougie*, Ger. *Licht, Talglicht, Wachslicht*, Sp. *Candela, Vela.*)

A cylinder or rod of wax, paraffin, or fatty substances surrounding a wick, and used for the purpose of lighting.

Wax candles are manufactured by a process called basting and rolling, and not by moulding, the means used for turning out the commoner

sort made of tallow or paraffin, since the wax adheres to the moulds. The wax is poured over a series of wicks suspended from a ring rotating horizontally over a cauldron. The candles are afterwards rolled between marble slabs into a smooth cylindrical form and trimmed according to taste by knives. Wax candles are still largely used in religious worship, but are not much employed domestically, their place, as well as that of sperm candles (which are made from a mixture composed of spermaceti and bees-wax), having been taken by those made from stearine. Stearine is the commercial name for stearic and palmitic acids and mixtures of them, substances obtained from animal and vegetable fats. Stearine candles are very common on the continent.

Common candles are made by dipping and moulding, though the latter is the process more generally used. In the dipping a number of twisted wicks, attached to a rod, are dipped repeatedly into a cauldron of melted tallow, and the tallow taken up allowed to solidify. The dipping is repeated until the required thickness has been attained. In moulding, moulds made of pewter or glass are arranged in a wooden frame which shape the candles. The wicks are stretched along the axes of the moulds and suspended, and the melted tallow poured into the moulds.

The paraffin which is now employed so largely in the manufacture of candles is obtained from bituminous shale and other mineral substances.

Machinery has been introduced for the whole process of manufacture, and the great care and trouble bestowed upon this industry have given rise to the production of a large variety of these artificial lighting substances.

Millions of pounds of candles are exported and imported annually.

Candleberry. (Fr. *Laurier*, Ger. *Lorbeere*, Sp. *Baya del laurel.*)

A small tree or shrub which is a native of the United States, but which has been naturalized in South Africa. It is known by various names—Candleberry Myrtle, Wax Tree, Wax Myrtle, Tallow Tree, Bayberry. The berries, when ripe, are covered with greenish white wax, which is collected by boiling them, and skimming the surface of the water in which they have been immersed. The wax is afterwards melted and refined. It is used sometimes in the manufacture of candles, which burn slowly with a small light and little smoke, and give out an agreeable odour. Scented soap can also be made from the wax.

Cane. (Fr. *Canne*, Ger. *Rohr*, Sp. *Caña.*)

The common name used in commerce for the stems of various grasses and palms. Bamboo, reed, and sugar canes are the stems of grasses. Rattan, Mallaca, and Tobago canes, imported for walking and umbrella sticks, are the stems of palms.

Cannel Coal. (See *Coal.*)

Cantharides. (Fr. *Cantharides, Mouches d'Espagne*, Ger. *Blasenkäfer, Spanische-Fliegen*, Sp. *Cantáridas.*)

The plural form of *cantharis*. The name is given to various blistering beetles. The chief European species is the green *Lytta vesicatoria*, commonly called "Spanish Fly," and this is the only one used medicinally. It has an extremely nauseous odour. Importations take place from Spain and Italy, but the greater part comes from Hungary. The insects are caught and preserved in well stoppered bottles, a little acetic acid being put in with them. When reduced to a fine powder they can scarcely be detected. Cantharidine is the crystalline substance contained in the beetle, and is the chief ingredient of all blistering fluids and the constituent of most stimulating hair-washes. It is exceedingly poisonous, and its internal use requires great care. The other principal species are the Chinese (*Mylabris Cichorii*) and the Japanese (*Epicauta gorrhami*).

Canvas. (Fr. *Canevas*, Ger. *Canevas*, Sp. *Cañamaza.*)

A strong cloth made of linen, cotton, or hemp. The name is derived from the scientific term for hemp—*Cannabis*. The finer is used for needlework, and the coarser for tent-coverings, sails of ships, etc. The canvas employed by artists is primed, or grounded a neutral grey, before being worked upon. There are certain recognised sizes of artists' canvases, as kit-cat, 28 by 36 inches; three-quarters, 25 by 30 inches; half length, 40 by 50 inches; Bishop's half length, 44 by 56 inches;

and Bishop's whole length, 58 by 94 inches.

Most of the canvas of commerce is manufactured in France, especially at the town of Flers, in the department of Orne. Canvas for needlework and tapestry is made at Beauvais and Paris.

Caoutchouc. (Fr. *Caoutchouc*, Ger. *Federharz, Kautschuk*. Sp. *Resina elastica.*)

An important elastic gum, commonly known as india-rubber. It is the sap or juice obtained from a variety of trees growing in the tropics. When the sap or juice flows it is like thin cream, but it gradually thickens upon exposure to the air. A mould of wood is then dipped into the juice, and exposed to the heat and smoke of a wood fire. The layer obtained coagulates, and this process is continued until the mass has attained the requisite thickness. The mould is then removed, and the india-rubber or caoutchouc is dried before being sent into the market. The principal supplies are obtained from Brazil.

Caoutchouc is a pure hydro-carbon. When carefully prepared it is white, but usually it has a brown or brownish-black colour. It is lighter than water, and though it does not dissolve in water it is soluble in essential oil and other solvents. It is tenacious and elastic, being very soft and pliant when gently warmed. It burns with a bright smoky flame and gives out a most unpleasant odour.

Vulcanized caoutchouc is a mixture of caoutchouc and flowers of sulphur, or sulphide of antimony. The mixture is exposed to a high temperature for a few hours, when an entirely new substance is produced. This vulcanization renders the caoutchouc more elastic and less porous, and especially valuable for manufacturing purposes. If the quantity of sulphur is increased and the temperature raised higher, a hard black horny substance called ebonite or vulcanite is the result.

Caoutchouc, either alone or modified, is used for an immense number of purposes. Amongst these may be mentioned springs and buffers, gas and water pipes, fire hose, door mats, dolls, machine belting, all sorts of water-proof coverings, cushions, beds, etc. Vulcanite or ebonite is employed in the manufacture of electrical appliances, combs, chemical apparatus, stethoscopes, speaking tubes, etc., and generally of those articles which cannot be made of horn or whalebone.

Capers. (Fr. *Câpres*, Ger. *Kappern*, Sp. *Accaparas.*)

The flower buds and young berries of the caper-bush—*Capparis spinosa.* The caper-bush bears a strong resemblance to the bramble. The buds and berries are pickled in salted vinegar as soon as they are gathered, and then become the capers of commerce. Their colour is greyish-green, to attain which a little copper is sometimes added. Capers are a favourite condiment and ingredient in sauces, etc. They are chiefly grown in the south of France and in Italy, and the principal export trade is carried on at Toulon, Marseilles, and Grasse.

Capsicum. (Fr., Ger., and Sp., *Capsicum.*)

The name of a genus of shrubby bushes of the order *Solanaceae*, prized on account of its fruit and seeds. The fruit is very variable in form, size, and colour, but red and yellow are its prevailing colours when ripe. The seeds are extremely pungent, and are used for sauces and mixed pickles, the latter being generally known as Mexican Chillies. When dried and ground the resulting substance is cayenne pepper. The properties of capsicum are owing to capsicine, a thick, light brown liquid. The capsicum plants are common in tropical and sub-tropical countries.

Caramel. (Fr., Ger., and Sp., *Caramel.*)

The spongy substance produced when sugar is heated to a temperature of 220° C. It is dark brown in colour, and is one of the causes of the colour of porter and of infusions of coffee. It is also used to colour whisky, wines, vinegar, etc. The brown produced on the outside when meat is roasted is a form of caramel, and this article is used by cooks to give a darker appearance to gravy. Caramel is nearly tasteless, but what slight flavour it possesses is detected in toast.

Caraway. (Fr. *Cumin de près*, Ger. *Kümmel*, Sp. *Comino.*)

A species of *Umbelliferae*. The plant

is valued and largely cultivated in many parts of Europe for the sake of its seeds. These seeds are sharp and somewhat pungent, and their properties are due to a volatile oil which can be extracted from them. They are useful to the cook and confectioner as a flavouring ingredient, and also to manufacturers of scented soaps and perfumes. From the seeds the liqueur *Kümmelbranntwein* is prepared.

Carbolic Acid. (Fr. *Acide carbolique, Phénol*, Ger. *Karbolsäure. Phenol*, Sp. *Phenol.*)

Also called Phenol. It is not a true acid. It is prepared from coal-tar, being an oily liquid at a high temperature, and, when pure, a colourless white crystalline compound at ordinary temperatures. Its chemical symbol is C_6H_5OH. In solution carbolic acid is an excellent antiseptic and a preventative of decomposition in animal and vegetable substances. It acts as an irritant poison if taken in any quantity. It is the source of various colouring matters.

Cardamoms. (Fr. *Cardamomes*, Ger. *Kardamome*, Sp. *Cardamomo.*)

The name applied to the aromatic seed fruits of certain plants belonging to the order *Zingiberaceæ*, which flourish in the East Indies. The seeds are used for making a pleasant cordial, and for rendering medicines more palatable, their virtue depending upon the presence of a volatile oil.

Carob. (Fr. *Caroube, Carouge, Cariobe*, Ger. *Karobbaum, Johannisbrodbaum*, Sp. *Algarrobo.*)

This tree is of the order *Leguminosae*, and is found near the shores of the Mediterranean. It is somewhat like the apple tree in size and appearance. The pods are known as carob-beans, and contain a sweet and nutritious pulp. They are one of the commonest ingredients of cattle foods. In Spain and Italy a strong spirit is made from them, as well as a liqueur. Other names of carob-beans are locust pods and St. John's bread.

Carpets. (Fr. *Tapis*, Ger. *Teppich*, Sp. *Tapete.*)

Woollen, worsted, or mixed fabrics used for the covering of floors. The manufacture of carpets dates from the earliest times, Persian and Indian carpets being specially noted, and to-day these carpets are highly valued for their beauty and finish. Persian pile carpets are made by knotting tufts of woollen yarn on the warp threads, the tufts being held in their place by the woof yarn. The finest are made in Kurdistan. In India the industry is very widely spread, and Persian influence is clearly shown. Silk and velvet are also used as materials for carpet making in India, and in Bengal and northern India even cotton enters into their composition. Turkey carpets were introduced to western Europe after the Crusades. These are made much like those of Persia and India, though the patterns are different—the most characteristic being diamond shapes and zigzags. The arrangement of colours produces a rich effect. They are made chiefly at Ushak, near Smyrna, and the exports from Smyrna to England exceed those to any other country.

Britain is the great headquarters of the manufacture of carpets, and besides those required for home use immense numbers are exported abroad, the value exceeding one million and a quarter sterling per annum. The principal seats of manufacture are Kidderminster, Halifax, Leeds, Kilmarnock, Glasgow, Aberdeen, and Dundee. The following are the chief kinds :—

1. *Kidderminster.* This is the oldest kind of machine made carpet, also known by the name of Scotch, and manufactured mainly at Kilmarnock. The carpets are either two-ply or three-ply, that is, they consist of two or three webs interwoven to form one piece, the weaving being done by the Jacquard loom. The patterns are produced by the different coloured webs.

2. *Brussels.* In these carpets wool is the main ingredient, with a back composed of stout linen thread. The pattern is produced by a surface of coloured worsted warp threads being woven down into the linen. A variety of Brussels carpets is the velvet pile or Wilton carpet, so prepared as to give the surface a velvet-like appearance.

3. *Tapestry.* These carpets are made by printing the warp yarn before weaving, and so dispensing with the

use of much of the apparatus required for Brussels carpets.

4. *Axminster.* The original Axminster carpets were imitations of Turkey carpets. In 1839, however, a patent was obtained for the manufacture of the most durable of all carpets. These have been commonly used in this country for more than half a century, and an improvement has recently been made by the introduction of Royal Axminster.

5. *Jute.* These are the cheapest of all carpets, since the fibre of jute is not very durable, nor is it easily dyed. They are made principally at Dundee.

Carrageen, (Fr. *Mousse d'Irlande, Mousse marine perlée,* Ger. *Carrageen, Irlandisches Moos,* Sp. *Carrageen, Musco Irlandes.*)

Also called Irish moss, the name of a species of seaweed—*chondrus crispus.* The seaweed is collected and washed in fresh water, and afterwards bleached and dried. It is then white or yellow in colour. When boiled with milk it forms a stiff jelly, which is valuable in cases of consumption and similar maladies on account of its nutritive properties. It is also employed for feeding cattle, and in the manufacture of paper, cloth, felt, straw hats, and for stuffing mattresses. Though obtainable off the coasts of Ireland, carrageen is chiefly imported from the United States.

Carrara Marble. (Fr. *Marbre de Carrara,* Ger. *Marmor ans Carrara,* Sp. *Marmol del Carrara.*)

The beautiful marble obtained from the numerous quarries in the neighbourhood of Carrara, a small town near Leghorn, in the north of Italy. It is a white saccharoid limestone, and its value to the sculptor consists in its texture, purity, and durability. It is estimated that more than 150,000 tons are annually exported, of which the United States take more than one-fourth.

Carrot. (Fr. *Carotte,* Ger. *Carotte,* Sp. *Zanahoria.*)

The well-known vegetable cultivated for the sake of its root. It is a biennial plant, and is found in various parts of the world. It thrives best in sandy or peaty soils. In colour it is generally red, though varieties of an orange or yellowish white are found. It is not very nutritive, but easy of digestion. Besides its use as a vegetable, the carrot is roasted and ground in Germany and substituted for coffee, a syrup is sometimes prepared from it, and even an ardent spirit may be obtained from it by distillation and fermentation.

Cascarilla. (Fr. *Cascarille,* Ger. *Cascarille,* Sp. *Cascarilla.*)

The Spanish name for "little bark," given to the bark of the *Croton Eluteria,* a small tree which grows in the West Indies. The bark is used for making incense and pastilles, and is imported mainly from the Bahama Islands. In Germany cascarilla bark is sometimes employed as a substitute for cinchona.

Cashew Nut. (Fr. *Noix d'acajou,* Ger., *Acajounuss,* Sp. *Nuez de acajou.*)

The fruit of a tree of the East and West Indies (*Anacardium occidentale*), which gives out a milky juice of use in the manufacture of varnishes. It has a bitter taste, but it is thought to give a pleasant flavour to Madeira and other wines. For the same reason it is sometimes mixed with chocolate.

Cashmere. (Fr. *Cachemire,* Ger. *Kaschmir,* Sp. *Cashmere.*)

The fancy woollen fabric obtained from the Cashmere goat. The fur of the animal consists of an inner coat of woolly greyish hair, and an outer one of long, fine, and silky hair. The hair is spun by women, then dyed, and afterwards manufactured into the valued Cashmere shawls. The demand for these articles has declined during the last thirty years, though the annual value of the exports from India still exceeds £120,000. In the London market Cashmere shawls are sold at prices varying from £100 to £300 each. Imitations of Cashmere shawls are now manufactured in Europe, the materials used being a mixture of Tibet wool, silk, and cotton.

Cassareep. (Fr., Ger. and Sp., *Cassareep.*)

The juice obtained from the tuber of the bitter cassava, *Jatropha manihot,* It is prepared mainly in British Guiana, and is used in the manufacture of various sauces, especially the well-known West Indian pepperpot. Its natural poisonous properties can be driven off by heat, and its antiseptic

value is widely recognised in the tropics.

Cassia Bark. (Fr. *Casse en bois*, Ger. *Kassiarinde*, Sp. *Cañafistola.*)

Sometimes known as China cinnamon. It is the aromatic bark of the *Cassia lignea*, and is imported from Southern China. It contains an aromatic essential oil, similar to oil of cinnamon, and often used as a substitute for it. The dried flower buds of the *Cassia lignea* are called cassia buds. They resemble cloves in appearance and are employed in the manufacture of confectionery.

Cast Iron. (See *Iron*).

Castoreum. (Fr. *Castoréum*, Ger. *Bibergeil*, Sp. *Castoreo*).

The secretion obtained from the reproductive organs of the beaver of Canada and Siberia. It is a soft brown substance, having a peculiar smell and taste, and is now used by perfumers. Its employment for medicinal purposes is obsolete. Its value is about £1 a pound.

Castor Oil. (Fr. *Huile de ricin, huile de castor*, Ger. *Rizinusöl, Castoröl*, Sp. *Oleo de castor.*)

The name of the plant *ricinus communis*, and also of the oil extracted from the seeds of the plant. It is a native of India, but its cultivation is now very widespread. The seeds are oval in shape, and mottled brown in colour. To extract the oil the seeds are first bruised between heavy rollers and then squeezed in a hydraulic press. The exuding oil is collected in vessels placed for the purpose. The crude oil is afterwards boiled with water, and the water allowed to evaporate. The boiling separates the albumen and other impurities. When pure, castor oil is thick and viscid, and of a light yellow colour, but inferior oil has a green or brown tint. Unless carefully made and kept it has a disagreeable taste and smell. Its medicinal properties are well known and greatly valued. The chief importation is from Calcutta. Castor oil is used in India for lamps, a good soap is made from it, and it is also employed in the manufacture of pomades and hair washes.

Catechu. (Fr. and Ger. *Catechu*, Sp. *Cachunda.*)

A substance prepared from the juice of different parts of several plants, used largely for tanning and dyeing, and also medicinally as an astringent. The chief plants used are the *Acacia Catechu* and the *Acacia Suma*, both natives of the East Indies. Catechu is obtained by cutting the wood of the tree into chips, boiling the chips in water, and adding more and more chips until the extract is of the thickness of tar. It is then run into moulds and allowed to harden. It has a dark brown colour, is dark and brittle, and has a shining surface when broken. It is quite odourless. Its colour is very permanent. Over 6,000 tons are annually imported from India into Great Britain.

Catgut. (Fr. *Corde à boyau*, Ger. *Darmsaite*, Sp. *Cuerda de tripa.*)

The material prepared from the intestines of sheep, and sometimes from those of the horse, the ass, or the mule —not from the cat. The intestines are thoroughly cleansed and steeped in water for a few days and afterwards scraped and treated with various chemicals. The larger are reserved for the sausage maker, and the smaller are again chemically treated and drawn out fine through a machine of special manufacture. The best catgut strings are made in Italy, especially at Naples, and are used for musical instruments, cords for clockmakers, etc. The annual imports are of the value of more than £3,000. Catgut obtained from horses and mules is made in France, and used for driving lathes and other small machines.

Cauliflower. (Fr. *Choufleur*, Ger. *Blumenkohl*, Sp. *Coliflor.*)

A variety of the common kale or cabbage. Its cultivation was not much attended to in England until the end of the seventeenth century. The heads alone are used as a vegetable. Cauliflower is cultivated for the supply of Covent Garden by market gardeners near London, and also by those of Cornwall, Devonshire, and the Channel Islands. It is more tender than broccoli, and can be obtained all the year round, but in winter time it requires careful protection from the cold.

Cavendish.

A species of tobacco, softened with molasses or liquorice juice. It is pressed into sticks or cakes. A very common name for cavendish is

" negro-head." There is a very large trade done in cavendish tobacco in England. In addition to that made for the English market, more than half a million tons are exported every year—the greater portion being manufactured in bond.

Caviare. (Fr. *Caviar*, Ger. *Kaviar*, Sp. *Caviario.*)

A condiment prepared from the roes of various kinds of fish, but particularly from those of the sturgeon. There are two kinds—ordinary caviare and pressed caviare. The first is obtained by pickling the roes in vinegar, the other by machine pressing after salting and subsequent drying. Caviare obtained from the sturgeon is nearly black, that from the mullet and carp red. Russia has practically the whole of the commerce in this article, and the preparation of caviare is almost entirely carried on at Astrakhan, the sturgeon being most plentiful at the mouth of the Volga. As much as 500,000 lbs. have been made in a single year. It is a favourite delicacy in the United States as well as in Russia, but the consumption in other countries is not large.

Cayenne. (See *Capsicum.*)

Cedar. (Fr. *Cedre*, Ger. *Zeder*, Sp. *Cedro.*)

Of the celebrated cedars of Lebanon but few remain, and the cedar wood of commerce at the present day is mainly derived fom the *Cedrus Australis* and the *Cedrus Toona*, varieties of the cedar found in the West Indies and Australia. The wood is generally hard and red, with a pleasing odour, and is remarkably free from knots. That of Havana, largely employed in the manufacture of cigar boxes, is straight grained. The wood of the *Juniperus Bermudiana*, another West Indian species, is used for casing lead pencils. Other varieties of cedar are found in, and the timber exported from, Syria, Asia Minor, and Cyprus.

Celery. (Fr. *Celeri*, Ger. *Sellerie*, Sp. *Apio.*)

The common name given to the *Apium graveolens*, of which both the root and the leaves are eaten, cooked or uncooked. The common celery of British gardens is the result of cultivation and improvement upon a species that grows wild in ditches and brooks. It requires a richly-manured soil, and careful tending about the roots and branches, in order that a supply may be provided throughout the winter. On the continent another species of celery is grown, the root of which is somewhat like a turnip.

Celestine. (Fr., Ger., and Sp., *Celestine.*)

A mineral, the native sulphate of strontium. Its chemical symbol is S_rOSO_3. It bears a very strong resemblance to heavy spar, the crystallization of both being rhombic, and is of a beautiful bluish colour—hence its name. Celestine is the source of nitrate of strontia, a substance largely used in the manufacture of fireworks. The most beautiful specimens are to be found in Sicily.

Celluloid. (Fr. *Celluloïd, Fibrolithoid*, Ger. *Celluloïd*, Sp. *Celluloid*,

Also called Parksine, from Parkes of Birmingham, who first manufactured it in 1856. It is an ivory-like compound, consisting chiefly of pyroxylin (a dried solution of gun cotton) and oil, though another variety can be made from pyroxylin and camphor. The pyroxylin is obtained by treating cellulose with a mixture of nitric and sulphuric acid, and dissolving the same with some solvent such as nitrobenzol. The resulting substance is then mixed with castor oil or cotton seed oil, and made into a kind of paste by passing it through hot rollers. At a temperature of 80° C. the celluloid is soft and can be moulded into any form desired. In order to remove every trace of the solvent the partly manufactured article is soaked in bisulphide of carbon or chloride of lime. Celluloid is very inflammable and burns with a yellow smoky flame, giving off a camphor-like odour. Its combustible nature may be neutralised by the addition of some non-combustible chemical, particularly tungstate of soda.

Celluloid can be made white as ivory, or coloured. It is unaffected either by water or by exposure to the atmosphere. Its uses in manufacture are very numerous. Billiard balls, piano keys, combs, knife handles, brush backs, napkin rings, buttons, thimbles, dolls, card cases, and studs are a few of the articles made from it.

When coloured it is employed as an imitation of amber, tortoise shell, malachite, etc.

Cellulose. (Fr., Ger., and Sp. *Cellulose.*)

One of the carbohydrates, made up in the same proportions as starch. Its chemical symbol is $C_6 H_{10} O_5$. It is the essential constituent of all vegetable structures. It is found in a nearly pure state in linen, cotton, and paper, and may be prepared from them chemically. Cellulose is valuable on account of the important compounds which are obtained from it when treated with nitric and sulphuric acid.

Chalcedony. (Fr. *Calcédoine*, Ger. *Chalcedon*, Sp. *Calcedonia.*)

A variety of silica, but differing from quartz in having no distinct crystalline formation. It is of a waxy lustre, and is usually either colourless or of a grey or brown shade, but beautiful blue specimens are sometimes met with. Chalcedony is the whole or principal part of many agates. It is much used in jewellery for the manufacture of brooches, necklaces, and ornaments of all kinds. The chalcedony received its name from the fact of its being found in the neighbourhood of Chalcedon in Bithynia. It is, however, widely distributed, and many specimens are obtained in various parts of England and Scotland.

Chalk. (Fr. *Craie*, Ger. *Kalk*, Sp. *Cal.*)

A soft earthy variety of limestone, or carbonate of lime. It is white, soft, opaque, and without the slightest appearance of polish in its fracture. It is often mixed with small quantities of silica, alumina, and magnesia. Though generally soft and earthy it is sometimes so compact as to be capable of being used as building stone. When burned it is changed into lime, and then largely used for making mortar. Chalk is very valuable in agriculture, for supplying deficiencies in certain soils, and as a manure. When pounded and purified it is known as whiting, and its domestic uses are very familiar.

Black chalk is quite distinct from common chalk, and is a peculiar kind of slate. It is used for drawing, and as a black colour in printing. It is a species of clay found in France, Spain, and Italy. Red chalk is a mixture of clay and peroxide of iron. It is used for colouring by painters, and occurs in clay-slate in Germany.

Champagne. (Fr. *Vin de Champagne*, Ger. *Champagner, Champagnerwein*, Sp. *Champaña, Vino de Champana.*)

The produce of the vineyards of the champagne district of France. Champagnes are either red or white, and the latter are sub-divided into sparkling and still. Sparkling champagne is the result of special treatment during the process of fermentation, and bottling before the fermentation is completed. Carbonic acid gas is thus generated. Champagne contains more alcohol than claret, but considerably less than sherry or port.

The best champagnes are produced at Rheims and Epernay. Sillery is the centre of manufacture of the still wine, and other noted places are Ay, Dizy, Hautvilliers, Mareuil, and Pievry. Spurious and adulterated champagnes are exceedingly common, a simple method adopted in the manufacture of such being the charging of light wines with carbonic acid gas.

It is estimated that France exports 20,000,000 bottles per annum, about four-fifths of its total production.

Charcoal. (Fr. *Charbon*, Ger. *Kohle*, Sp. *Carbon.*)

An impure form of carbon. It is very rarely found in a pure state in nature, and must therefore be prepared. The most common method of preparation is that of heating animal or vegetable substances in some closed vessel, so as to avoid contact with air —the residue being charcoal. The purest form is that obtained when pure white sugar is heated in a platinum vessel. This is the charcoal used in chemical processes where purity is essential. When it is manufactured on a large scale, wood is heated in iron retorts until the whole of the volatile products are driven off, the quality of the charcoal depending very largely upon the kind of wood used. Animal charcoal or bone black is the residue when bone has been heated or burned.

Good charcoal is of a pure black colour and gives neither smoke nor flame when it is burned. It is

extremely porous, and is insoluble in any known liquid. Owing to its power of condensing unwholesome gases within its pores, it is very useful as a disinfectant, removing offensive smells, and as a purifier of water, for which reason it is often found in filters. Charcoal is also employed in sugar refining to remove the brown colour from unrefined sugar, in the manufacture of gunpowder, and for various purposes in medicine.

Chartreuse. (Fr., Ger., and Sp. *Chartreuse.*)

A favourite liqueur, made by a secret process from mixed spirits and cordials, and sweetened. The name is derived from the monastery of the Grande Chartreuse, near Grenoble, in the south of France. There are two kinds which enter into commerce, green and yellow. A formidable competitor of chartreuse, as a liqueur, is Benedictine.

Cheese. (Fr. *Fromage*, Ger. *Käse*, Sp. *Queso.*)

The nutritious food substance made from compressed and partially dried curd of milk. There are many kinds of cheeses, and the process of manufacture varies in different localities, but the main principle is generally the same. The milk is first warmed and fermentation set up by the addition of a small quantity of rennet. This causes a separation in the form of curd of the casein and the fatty matter in the milk. The curd is then broken up and drained from the whey or watery part of the milk. The remaining portion of the whey is extracted by means of a press, and the residue is again broken up, salted, and turned into the required shape. It is afterwards dried in a well-ventilated room. For the purposes of colouring annatto is generally used. The richest cheeses, Cheddar, Cheshire, Gloucester, and Somerset, are made from new milk, and in the manufacture of Stilton cheese cream is even added to the new milk. From being an industry connected with the dairy cheese making has become a trade which requires huge factories and many hands. England imports hundreds of tons annually, mainly from America. Gruyère is made in the canton of Fribourg, Switzerland. Other highly prized cheeses are Camembert, Brie, Lenbury, and Gorgonzola.

Chicory. (Fr. *Chicorée*, Ger. *Zichorien-Wegwart*, Sp. *Achichoria.*)

Also called Succory. The common chicory (*cichorium Intybus*) grows wild in England and many parts of Europe. Its root is formed like a carrot, and is of a brownish colour, but white within. The herbage of the plant is good food for cattle, but the plant itself is cultivated on account of its root, which is often used as an adulteration in coffee and sometimes as a substitute for it. When the root is pulled up it is washed, cut, and dried in a kiln. The mass which remains is then roasted and ground like coffee, and a small quantity of butter or lard is added to improve its appearance. Chicory contains much sugar, but is not otherwise a useful article of food. When steeped in water it imparts a deep brown colour to the liquid, and on this account it is used with coffee, so as to give an appearance of greater strength. The raw or kiln-dried root is largely imported from Belgium and the north of France, and a duty of 13s. 3d. per cwt. is imposed upon it.

Chillies. (See *Capsicum.*)

China Clay. (See *Kaolin.*)

Chinchilla. (Fr., Ger., and Sp., *Chinchilla.*)

The name of a South American rodent, much resembling a squirrel, and valued on account of its soft grey fur. Thousands of these little animals are killed annually in Chili and Peru, and the furs are exported for making up into ladies' muffs, boas, cloak linings, trimmings, etc.

Chinese White. (Fr. *Blanc de zinc*, Ger. *Zinkweiss*, Sp. *Blanco de zinc.*)

The white oxide of zinc, Zn_1O. It is the permanent white pigment used in the arts, and was substituted a century ago for white lead, which was a most unsatisfactory pigment on account of its change of colour to brown on exposure to the atmosphere.

Chintz. (Fr. *Indienne*, Ger. *Zitz*, Sp. *Persiana, Tela de los Indias.*)

A variety of highly-glazed calico, printed with many coloured patterns on a white ground. Its former use as a covering for furniture or as bed-hangings has become obsolete, and in England it is now chiefly employed as

covering for babies' bassinettes.

Chiretta. (Fr. *Cherette*, Ger. *Cheretta, Chiretta*, Sp. *Cerette.*)

Or chirata. An intensely bitter plant grown in India, and exported when dried in large quantities to Europe for the purpose of making bitters. It is an excellent substitute for gentian. In India it is used as a tonic, and in Europe medical practitioners have found it valuable in cases of fever.

Chittagong Wood. (Fr. *Bois de Chittagong*, Ger. *Chittagongholz*, Sp. *Madera de Chittagong.*)

The beautifully veined and mottled wood of a species of cedar tree grown in the district east of Bengal. The name is given rather widely by cabinet-makers to various woods of the same kind, In India it is generally known as the cedar, and is used there as mahogany.

Chloral. (Fr. *Chloral*, Ger. *Chloral*, Sp. *Cloral.*)

A colourless oily liquid formed when anhydrous alcohol is acted upon by dry chlorine. Its odour is powerful and pungent. The name is often given incorrectly to the white crystalline substance produced by the combination of equal portions of chloral and water. The principal action of chloral is to produce sleep, and it is used, though somewhat uncertainly, as an anaesthetic. It acts as an antidote in cases of strychnine poisoning. Pure chloroform is obtained from chloral hydrate and caustic potash.

Chlorate of Potash. (Fr. *Chlorate de Potasse*, Ger. *Chlorsaures Kalium*, Sp. *Potasio cloroso.*)

The potassium salt of chloric acid. It is prepared by the action of chlorine gas upon a warm solution of chloride of potassium, in which solution slaked lime is suspended. Its uses include the manufacture of fireworks, of oxygen for lime light, and of safety matches. When mixed with charcoal or sulphur it forms a highly explosive mixture. It is also of value in medicine, especially as a remedy for sore throats.

Chlorine. (Fr. *Chlore*, Ger. *Chlor*, Sp. *Cloro.*)

A heavy, yellowish-green, incombustible gas with a suffocating odour, a bad supporter of combustion. It is always found in combination in nature, most commonly in salt or sodium chlorate. The principal uses of chlorine are the bleaching of cotton and linen, though it is also combined with many substances to form compounds of value in the arts and in medicine.

Chlorodyne. (Fr., Ger., and Sp., *Chlorodyne.*)

A patent medicine of increasing popularity. It is a mixture of opium, chloroform, prussic acid, Indian hemp, sugar, and peppermint. Its use as an opiate is questioned by many medical men, though it has been found effective when other opiates have failed. It is also drunk for the sake of its stupefying and intoxicating qualities.

Chloroform. (Fr. *Chloroforme*, Ger. *Chloroform*, Sp. *Cloroforme.*)

The valuable anaesthetic brought into general use a little more than half a century ago. It is a compound of carbon, hydrogen, and chlorine, its chemical symbol being $CHCl_3$. It is usually prepared from bleaching powder, alcohol, and water, but further treatment with sulphuric acid is necessary to secure purity. Chloroform is itself a colourless, volatile, heavy liquid. Its odour is peculiar and its taste sweet. It is never met with in commerce in its pure state as it rapidly decomposes when exposed to light. Though its main use is as an anaesthetic it has other very numerous medicinal properties.

Chocolate. (Fr. *Chocolat*, Ger. *Chokolade*, Sp. *Chocolate.*)

A preparation made by grinding the seeds of the *Theobrama Cacao* to a fine paste. The unmixed paste is cocoa, but when flour, sugar, and one or more flavouring materials have been added chocolate is obtained. It is an exceedingly nutritious beverage when mixed with water or milk, and has long been in high favour with all Europeans. It was introduced from America to Europe after the Spanish conquests in the early part of the sixteenth century. The imports into Great Britain have increased enormously during the last thirty years. There is a duty of 2d. per lb. imposed upon it. France is easily the first country in the world in the manufacture of chocolate.

Chromium. (Fr. *Chrome*, Ger. *Chrom*, Sp. *Cromo.*)

One of the metals, which, though not much employed by itself, forms valuable compounds when mixed with other metals. In nature it is widely distributed through Sweden and Hungary, and also in America, in combination with iron, and is known as chrome iron ore. Chromic oxide, otherwise chrome green, is the colouring ingredient of the emerald. This oxide is much used in porcelain painting, and as a substitute for arsenic green in wall papers. Chromate of lead, generally known as chrome yellow, is valuable in the dyeing of calico. Bichromate of potash is another compound which is largely employed in photography, and, when mixed with sulphuric acid, acts as a bleacher of oils. A small quantity of chromium added to steel gives hardness and strength to chrome steel, and in the manufacture of projectiles chromium is generally added to the iron.

Cider. (Fr. *Cidre*, Ger. *Apfelwein*, *Obstwein*, Sp. *Sidra.*)

The fermented liquor produced from the juice of apples. It is produced in great quantities in several English counties, notably Worcester, Hereford, Devonshire, Somerset, and Gloucester, and also in the United States, Germany, and France. In the last mentioned country it comes after wine in the order of production of liquids, beer taking the third place.

The apples selected for the manufacture of cider are not those which are fit either for eating or for ordinary cooking. In fact, the bitter ones are most preferred. In the English counties where the beverage is produced there are special apple orchards. The fruit is gathered when nearly ripe, and the apples are ground and crushed until they are reduced to a pulp. This is done in mills specially constructed for the purpose, the mills having fluted rollers. The pulp is then placed in coarse canvas bags to be drained, and the resultant juice put into casks where it is allowed to ferment. The fermentation takes place best when the juice is exposed to the air in the shade. After the sediment has subsided the liquor is run off and collected. The excellence of the cider depends upon the proper time chosen for running off the liquid.

The best cider is mellow and has the character of wine—it is neither sweet nor acid. It contains from 5 to 10 per cent. of absolute alcohol. It requires much care in bottling, only clear samples being fit for use, and the age should be at least twelve months before bottling is attempted. The liquid known as "champagne cider" is slightly sweet cider which is bottled before fermentation is completed. A weaker cider is obtained by adding water to the pressed pulp before fermentation.

Most of the cider produced is consumed in the country where it is made, but England exports a small quantity.

Cigars and Cigarettes. (See *Tobacco.*)

Cinchona. (Fr., Ger., and Sp., *Cinchona.*)

The name of an important genus of trees, which yield the bitter alkaloid quinine and its congeners. The trees are all evergreen, with laurel-like leaves and panicles of flowers resembling the lilac. The flowers are very fragrant, and are white, pink, rose-coloured, or purple in colour. Formerly cinchona was unobtainable except from South America, but now its cultivation is fairly wide-spread, especially in southern India, and the East and West Indies. The cinchona bark is variously known as Peruvian Bark, Jesuits' Bark, China Bark, Quina, Quinquina, etc.

The cutting and peeling of the cinchona trees take place in the dry season. The trees are cut as near to the roots as possible. The bark is then stripped off, dried, and packed.

The bark is valuable, as above stated, for the quinine which is obtained from it. The native Indians neither knew nor valued its properties, and refuse to use it to the present day. In Europe, however, if has been largely employed in medicine for more than two centuries as a stimulant and a tonic, and in cases of intermittent fever. The quantity imported is continually increasing.

Cinnabar. (Fr. *Cinnabre*, Ger. *Zinnober*, Sp. *Cinabrio.*)

The ore of mercury, found in nature

and generally known as sulphide of mercury. It is from cinnabar that almost the whole of the mercury of commerce is obtained, the ore containing about 86 per cent. of mercury and 14 per cent. of sulphur. It occurs most frequently in rocks of the coal formation, and is found either fibrous and amorphous, or crystallised and massive in six-sided prisms. In the mass it has a dull red colour, and is opaque. Its specific gravity is about 8. Until recently cinnabar was obtained almost entirely from Almaden, in Spain, but there are now very productive mines at New Almaden, in California. There are also mines in Idria (Austria), Germany, China, and Japan. Cinnabar, when artificially prepared, constitutes the pigment known as vermilion.

Cinnamon. (Fr. *Cinnamone, Cannelle*, Ger. *Zimmet, Kaneel*, Sp. *Canela.*)

A plant of the laurel order, which supplies the aromatic bark from which the cinnamon and cassia bark of commerce is obtained. The finest kind is produced by the *Cinnamomum Zeylamicum*, which is extensively cultivated in Ceylon, though much is exported from the East Indies. The bark is of a greyish-brown colour on the exterior, but internally it is reddish. For commercial purposes the bark is cut off the trees, exposed to the sun, dried, and tied up in bundles of about 88 lbs. in weight. Cinnamon depends for its aroma and properties upon the presence of a volatile oil, the oil of cinnamon. It is largely used by cooks and confectioners as a condiment, and it is valued medicinally as an astringent and a cordial. About three quarters of the total production of Ceylon is sent to England, but the imports have recently been falling off owing to unremunerative prices.

Citric Acid. (Fr. *Acide citrique*, Ger. *Citronensäure*, Sp. *Acido citrico.*)

The acid contained in the juice of lemons, oranges, limes, gooseberries, and other acid fruits, and to which they owe their sour taste. Its chemical symbol is $H_3C_6H_5O_7$. For almost all practical purposes it is prepared entirely from lemon or lime juice, the juice being treated with chalk and slaked lime. Then citrate of calcium is formed as a white insoluble powder, which is collected and decomposed by the addition of dilute sulphuric acid. A solution of citric acid is obtained, and the colourless crystalline compound is the result of subsequent evaporation. Citric acid has a pleasant acid taste, and is largely used for domestic purposes. It is also used by calico printers for discharging the mordant from the cloth, and in the dyeing of silks. In medicine it is frequently employed, and its salts are known as citrates, the principal being citrate of magnesia, citrate of potash, citrate of ammonia, and citrate of iron.

Citron. (Fr. *Citron*, Ger. *Citrone, Limon*, Sp. *Limone.*)

The fruit of the *citrus medica*, a species of lemon. By many botanists the lemon, orange, lime, and bergamot are considered to be varieties of the citron. The fruit itself is usually large, furrowed, and warty, whilst the rind is extremely thick and spongy, and the pulp somewhat acid. It is cultivated in the tropics of both hemispheres, though it is a native of northern India. It is chiefly valued for the rind, which is particularly fragrant and of a fine yellow colour when ripe, and which is either candied or used as a preserve. From the citron oil of citron and oil of cedrate are obtained, greatly valued by perfumers. The principal supplies of Great Britain are obtained from Italy, Greece, and Spain. The rind is salted before it is exported.

Civet. (Fr. *Civette*, Ger. *Zibeth*, Sp. *Algalia.*)

An oily pomade-like substance, yellow when fresh, but gradually turning to brown by keeping, with a strong musky odour. When the quantity is large the odour is very disagreeable, but in small quantities the smell is aromatic and exceedingly pleasant. It is only used in perfumery. Civet is obtained from the civet cat, a carnivorous animal which inhabits the warm countries of Africa, and especially Abyssinia, where it is domesticated. The substance is secreted by a double pouch situated under the abdomen, and close to the tail. As the animal is too valuable to be killed on account of its scent pouch, the secretion is obtained by periodically

scraping the inside of the pouch with a spoon. It is generally exported in cow horns, each horn containing from 1 to 3 lbs.

Claret. (Fr. *Vin de Bordeaux*, Ger. *Bordeauxwein*, Sp. *Vino de Bordeaux.*)

The light French red wines of Medoc, mostly shipped from Bordeaux. They are generally shipped in hogsheads containing about 50 gallons each. The different kinds of claret vary in their quality and value, but the name is ordinarily confined to the cheaper sort. Some, however, as Château Lafitte, are held in high repute. The strength of alcohol is about 9 per cent. The name claret, as used in England, is unknown in France.

Clay. (Fr. *Argile*, Ger. *Thon, Töpferrdde*, Sp. *Argilo.*)

The name very generally applied to every kind of earth which makes a paste when water is added to it, and which is easily moulded and becomes hard when heated with fire. Clay is mainly a compound of silica and alumina, though many other substances often enter into its composition, especially lime and iron. The purest form of clay is kaolin, or China clay, which is used in the manufacture of porcelain. It is obtained by crumbling down felspar, a silicate of alumina and potash, found in granite rocks. The Worcester manufacturers draw their supply of kaolin from Cornwall. It is found also in parts of China, Japan, France, Saxony, and the United States of America. Other clays are known as pipe clay, potter's clay, and fire clay. Common clay, also called loam, is abundantly distributed, and is used for the manufacture of bricks, tiles, and coarse earthenware. It is an important part of all fertile soils, and is of the greatest agricultural importance owing to its absorbent powers.

Cloves. (Fr. *Clous de Girofle*, Ger. *Nelken, Gewürznelhen*, Sp. *Clavo de girofle.*)

The well known spice, the dried, unexpanded flower-buds of the *Caryophyllus aromaticus*. The clove tree is one of the myrtle order, and is a native of the Moluccas. The flowers are odoriferous, and the bark, fruit, leaves, and roots are of a more or less aromatic character. The French name *clou* is given to the clove on account of the resemblance of the flower-buds to nails. The unripe fruit is called "mother cloves," and though inferior to ordinary cloves they are much used in China, and are sometimes imported into this country.

The buds are gathered either by hand, or by beating the bushes with a stick, and are dried by exposure to the smoke of a wood fire and then by the rays of the sun, or by the latter alone. When they are gathered their colour is red, but afterwards they become a deep brown.

The virtue of cloves depends upon an essential oil—the oil of cloves. They are used very largely in perfumery, and domestically they are valued for the flavour they give to dessert dishes and articles of confectionery, and for their power in driving away moths from clothing, furs, etc. They possess a hot taste and a characteristic odour. Oil of cloves is obtained by repeated distillation. Two oils pass over, one lighter, the other heavier than water. The oil has a hot acrid taste, and when pure has a yellow colour. The less carefully prepared oil is brown or red. Medicinally oil of cloves is useful in checking nausea. It is used by soap makers for scenting soap, and in various ways by distillers for imparting flavours.

The best cloves are obtained from Amboyna, a small Dutch island in the East Indies. At one time the Dutch had a monopoly of cloves and nutmegs, but now the clove tree is cultivated in Java, Sumatra, Réunion, Mauritius, Zanzibar, and also in the West Indies.

Coal. (Fr. *Charbon de terre, houille*, Ger. *Kohle*, Sp. *Carbon.*)

The most important of all fuels. It consists mainly of carbon with small quantities of oxygen, hydrogen, and nitrogen. There is also in addition a little mineral matter or ash, but this should not exceed 10 per cent. of the whole. Coal occurs in beds, the beds varying in thickness from a few inches to several feet, and often extending over a considerable area. It is of vegetable origin, most probably being the remains of vast forests of the carboniferous period. Owing to the enormous pressure of the superincumbent matter, the chemical composition

of the original vegetable has undergone a complete change, and the vegetable structure has been completely destroyed. The principal varieties of coal are (1) Brown, an impure substance, which shows distinct traces of its vegetable origin; (2) Bituminous, a hard and compact coal containing 88 per cent. of carbon, and splitting up into rough cubical masses; (3) Anthracite, containing 95 per cent. of carbon. This is hard, dense, and often lustrous, and does not soil the fingers when touched. The alteration of the vegetable matter has gone further in this kind than in ordinary coal. It is difficult to ignite, but it burns with little flame or smoke, and gives out an intense heat. It is particularly useful for marine engines, metallurgical operations, etc. The chief supplies are obtained in South Wales and the United States. (4) Cannel, compact and lustrous, and burns with a highly luminous flame. It is mostly used in the manufacture of coal gas.

Coal is found in most parts of the world, but the chief working of the mines is in England. The export trade has increased with amazing rapidity, and alarm has been felt as to the probable exhaustion of the supplies. It has, however, been confidently asserted that there is still sufficient to meet all ordinary demands for at least 200 years. Mining is also carried on extensively in the United States, Belgium, France, Prussia, and Russia. The great beds of India, China, and Canada are practically untouched.

Coal Tar. (Fr. *Goudron*, Ger. *Steinkohlenteer*, Sp. *Homoguera.*)

This substance, also called gas tar, is a thick, black, opaque liquid which comes over when coal or petroleum is distilled, though it is now generally obtained in the manufacture of gas. It is slightly heavier than water and possesses a strong, disagreeable smell. Its great value consists in the fact that it is the source of benzene, and through benzene of the aniline dyes.

Cobalt. (Fr. *Cobalt*, Ger. *Kobalt*, Sp. *Cobalto.*)

A steel-grey metal with a reddish tinge, hard, brittle, and very magnetic. It is nearly as infusible as iron. It is rarely found native, and its ores are sparingly distributed, being generally combinations with arsenic and sulphur. Our imports are mainly from Germany. The metal alone is of little value, but many cobalt compounds are employed as pigments, being remarkable for beauty and brilliance of colour, and impart a magnificent blue tint to glass. Smalt, used by paper stainers and others, is glass coloured by oxide of cobalt and reduced to a very fine powder. An impure oxide of cobalt, known commercially as "zaffre," is valuable in enamel painting. Smalt is also used in the production of the blue colours in porcelain, pottery, glass, tiles, frescoes, etc.

Coca. (Fr., Ger., and Sp. *Coca.*)

A shrub, *Erythroxylon Coca*, which grows in many parts of South America. The leaves furnish a narcotic and stimulant, and are used in Europe in the manufacture of tonic wines. These leaves are in high favour with the Indians, who sometimes make an infusion from them. They have a soothing effect like tobacco, but their influence is more remarkable, as they lessen the desire for food and permit of more sustained exertion. Interest was first awakened in coca by the experiments of the pharmacologist Christison. The active properties of coca depend upon the presence of an alkaloid cocaine which is now in regular use as a local anæsthetic in dentistry and slight surgical operations. It is also employed by oculists for the purpose of dilating the pupils of the eyes and removing all sensibility.

Cochineal. (Fr. *Cochenille*, Ger. *Cochenille*, Sp. *Cochinilla.*)

The scarlet and crimson dye stuff obtained from the cochineal insect. It consists simply of the dried bodies of the female insect, *coccus cacti*, a name given to it because it feeds upon plants of the cactus family. When dried the bodies have the appearance of tiny eggs, as many as 70,000 being required to make up one pound of the dye stuff. The insect, as well as the cactus upon which it feeds, is a native of Mexico, but it is in Guatemala that the rearing of the cochineal and the cultivation of the cactus are mainly carried on. Efforts have been made to transplant the cactus and to transfer the insect to other parts of the world.

Success has attended these efforts in the Canary Islands, Algeria, Java, and Australia, but in India it has proved a failure. The cochineal industry, which was very extensive half a century ago, has suffered considerably through the introduction of aniline dyes.

Cocoa. (Fr. *Cacaó*, Ger. *Kakao*, Sp. *Cacao.*)

The seeds of the tropical tree, *Theobroma Cacao*, much used in the preparation of a beverage. The tree is a native of the West Indies and tropical America, though it is cultivated also in Asia and Africa. The fruit is, shaped like a cucumber, and within are the seeds, the cocoa nibs of commerce, from which the cocoa is obtained. To prepare cocoa for use, the seeds are roasted and bruised to loosen their skins, and the seed lobes are crushed and ground between rollers to reduce them to a pasty consistence. The sweetened paste, flavoured with vanilla or cinnamon, constitutes chocolate.

Cocoa contains the active principle *theobromine*, an alkaloid resembling caffeine. Owing to the presence of fatty and nitrogenous matter it forms an excellent food The number of preparations made from cocoa, when the oily matter called butter of cocoa has been extracted, is considerable, the principal being cocoatina, cocoa essence, and concentrated cocoa.

The chief supplies of Great Britain are derived from Trinidad and the states of Central America.

Cocoa Nut. (Fr. *Noix de coco*, Ger. *Kokosnuss*, Sp. *Cocos.*)

The fruit of the palm *Cocos nucifera*, which grows near the sea in most tropical countries. The nuts are largely imported in husk, and sold to fruiterers, the husk being used for coir yarn. The cocoa nut is a native of the East Indian coasts, and the South Sea Islands, but the cultivation of the tree has been widely spread, and the nuts are now much used as food in the tropics. The kernel of the cocoa nut contains a large percentage of fixed oil called cocoa nut oil, or cocoa nut butter. This oil is commercially valuable in the manufacture of stearine candles and of a marine soap which forms a lather with sea-water. In the East it serves as an oil for lamps and also as an ointment

Cod. (Fr. *Morue*, Ger. *Kabeljau, Stockfisch*, Sp. *Pejepalo, Truchueta.*)

The valuable food fish which belongs to the family of fishes in which haddocks, whitings, etc., are included. The fishery gives employment to a vast number of hands on the coasts of the United Kingdom, Holland, Sweden, Norway, Iceland, and Newfoundland. The average length of the cod is about 3 feet, and the weight about 12 lbs. Besides its value as a food in either a fresh or a salted condition, it is the source of the medicinal cod liver oil. Cod roes are considered a great delicacy.

Cod Liver Oil. (Fr. *Huile de foie de morue*, Ger. *Lebertran, Medizinaftran*, Sp. *Oleo de higado de pejepalo.*)

The oil obtained from the livers of certain fishes of the Godidae order—cod, haddock, whiting, etc. It is produced in Newfoundland and Norway, and is of a white, pale, or brown colour according to the manner in which it is prepared. An impure variety, coarse and unrefined, is also obtained during the making of the better oil, and this is known as cod oil. It is used chiefly by curriers. The usual method of obtaining cod liver oil is to wash the fresh liver of the fish so as to remove any trace of gall. The liver is then heated with boiling water and the oil which rises to the surface skimmed off. Any excess of water is driven off by heat and the resulting oil strained through cloth bags of varying fineness in order to remove solid matter. The best oil is without taste, smell, or colour, and the disagreeable taste and smell found in the ordinary cod liver oil is due to the putrefaction of small matter which the filtration has failed to remove. Olein, palmitin, stearin, butyric and acetic acids, and gaduin are the chief constituents of cod liver oil, the nutritive fatty matters making it an extremely valuable medicine in pulmonary diseases.

Cœrulein. (Fr., Ger., and Sp., *Cœrulein.*)

A recently introduced dye, used for the purposes of dyeing and calico printing. It is obtained by treating gallein with sulphuric acid. By dissolving coerulein in an alkaline solution a beautiful green colour is obtained

which acts as a fast dye in combination with the mordant alumina. By various other treatments it is possible to obtain colours of different hues, some of which are very valuable in dyeing wools.

Coffee. (Fr. *Café*, Ger. *Kaffee*, Sp. *Café.*)

The horny seeds of the coffee tree—*Coffea Arabica*. The tree belongs to the species *Rubiaceae* or *Cinchonaceae*, of which there are 50 or 60 kinds, but the coffee tree is the only one which produces the article of commerce. A native of Abyssinia, it is now common throughout the tropical regions of Asia and America. The value of coffee consumed is over £60,000,000 per annum.

The berries of the tree are gathered when ripe, and variously treated in order to remove all foreign matter. They are afterwards roasted with the result that there is a great reduction in size, and a development of a volatile oil and a peculiar acid. When used for domestic purposes chicory is very frequently added to coffee.

The active principle of coffee is caffeine, and the physiological effect of taking it is to stimulate the brain and produce sleeplessness. It is thus an antidote to narcotic poisons.

Essence of coffee is a concentrated infusion of coffee mixed with extract of chicory and burnt sugar, the mixture being made as thick as molasses.

India, Ceylon, Java, Brazil, and Arabia are the chief exporting countries.

Cognac. (Fr., Ger., and Sp., *Cognac.*)

The best brandy, so called from the place of its manufacture, in the district of Charente, near Rochefort. In France cognac is often called "fin champagne."

Coir. (Fr. *Coir.*) Ger. *Cocosbast*, Sp. *Coire.*)

Or cocoa-nut fibre, obtained from the husks of the cocoa-nut. The husks are steeped in water for a considerable time, often months, before the fibre can be separated and made ready for use. It possesses great strength and is capable of being worn for a long time, hence its value in the manufacture of hall mats, etc. Coarse brushes, ropes, and cables are also made of the fibre, especially by the Pacific islanders. The trade in the article is carried on almost exclusively by Ceylon, whence the supplies of the United Kingdom and the United States are obtained.

Coke. (Fr. *Coke*, Ger. *Koke*, Sp. *Coke.*)

The residue left when coal has been deprived of the greater part of its hydrogen, oxygen, and nitrogen. It bears the same relation to coal that wood charcoal bears to wood. It is largely obtained as a bye-product in the manufacture of gas for illuminating purposes; but the best coke is carefully prepared by heating coal to a high temperature in a closed vessel or coke-oven. Coke consists mainly of carbon. It is difficult to ignite, but it burns with great heat and without smoke, and is therefore valuable for metallurgical operations. It is hard, brittle, and porous, possesses a grey metallic lustre, and does not soil the fingers.

Cola. (Fr. *Cola*, Ger. *Kola*, Sp. *Cola.*)

The ordinary name of the *Cola acumenata*, a tree of tropical Africa, valuable on account of its seeds or nuts, which are used as a condiment in Africa and South America, and in which an extensive trade is carried on. The nuts have a bitter taste, and possess qualities resembling those of cinchona bark.

Colchicum. (Fr. *Colchique*, Ger. *Zeitlose*, Sp. *Cólquico.*)

A plant belonging to the order of the lily family, and called *Colchicum autumnale*; the only British specimen is the autumn crocus, otherwise meadow saffron. The flowers are purple and the seeds dark, resembling black mustard seeds. The whole plant is acrid and somewhat poisonous, and contains an alkaloid Colchicine or Colchicia. The seeds are valuable in medicine, especially in cases of gout and rheumatism.

Collodion. (Fr. *Collodion*, Ger. *Collodium*, Sp. *Collodion.*)

A solution of gun cotton or pyroxylin in a mixture of ether and alcohol. The best gun cotton for its preparation is obtained from cotton-wool, nitre, and sulphuric acid. There are numerous varieties of collodion depending upon the method of preparation, and of these some are extremely useful in surgery, and others in photography.

Their surgical use is for wounds, the collodion being mixed with a little castor oil. A popular corn cure is salicylated collodion, composed of collodion, salicylic acid, and Indian hemp.

Colocynth. (Fr. *Colocynthine*, Ger. *Coloquinte*, Sp. *Coloquintida.*)

The dried and powdered pulp of the bitter cucumber, a fruit much resembling an orange in appearance, and growing in immense quantities in N.E. Africa, Asia Minor, Syria, and Spain. The chief exports are from Smyrna. The fruit is collected before it is ripe and dried artificially. It has been used as a medicine for centuries, and is generally administered in the form of pills combined with aloes, scammony, and calomel. Colocynth also enters into the composition of certain moth powders.

Colophony. (Fr. *Colophone*, Ger. *Geigenharz*, *Kolophonium*, Sp. *Colofonia.*)

The name often given to black resin, the solid substance left when crude turpentine is distilled. It is generally rolled up in pieces of paper, and used for rubbing the strings of violins, etc.

Colza. (Fr. *Colza*, Ger. *Raps*, Sp. *Colsa.*)

The summer rape, a species of cabbage extensively grown in France and the north of Europe. From it an oil of a yellowish colour, called colza oil, is obtained by means of crushing mills. At one time this oil was used very generally for illuminating purposes, but latterly it has given way to the cheaper petroleum oils. The residue of the colza, after the extraction of the oil, is known as rape-seed, and is used for manure. The oil is chiefly produced at Marseilles, from which city there is a considerable export trade.

Comb. (Fr. *Peigne*, Ger. *Kamm*, Sp. *Peine.*)

The toothed instrument used for dressing and fastening the hair by all nations. The various substances used in the manufacture of combs include horn, tortoise-shell, ivory, bone, wood, metal, indiarubber, and xylonite, the first named being the most common. The whole manufacture of combs is now carried out by machinery, though much care is necessary in cutting the various materials used to avoid waste.

Conchs. (Fr. *Conques*, Ger. *Schneckenmuscheln*, Sp. *Caracol.*)

The name given to large shells used for ornaments or for cutting cameos. One kind, known as the *Strombus gigas*, is of a pink colour, and from it are often obtained fine pink pearls. The shells are found chiefly in the Bahamas, and the export trade is of the annual value of about £2,000.

Condurango Bark. (Fr. *Écorce Conurango*, Ger. *Condurango Rinde*, Sp. *Corteza de condurango.*)

The bark of the *Gonolobus Condurango*, a climbing shrub of South America. It contains a drug which is reputed to be efficacious in cases of venomous bites, and which gives relief to patients suffering from cancer.

Conger. (Fr. *Congre*, *Anguille de mer*, Ger. *Meeraal.*, Sp. *Congrio.*)

Or conger-eel, a fish of the eel family, widely distributed, though the species vary considerably. The best known in England is the common conger, of a brownish-black colour, which is taken in large numbers off the coasts of Devonshire and Cornwall. The flesh, though coarse, is much eaten, and the conger is often used for making so-called turtle soup.

Contrayerva. (Fr., Ger., and Sp. *Contrayerba.*)

A plant of tropical America, the *Dorstenia Brasiliensis*. The root was at one time held in high repute on account of the drug obtained from it, which was supposed to be of great value in cases of low fever, and as a cure from snake-bites. Its use has greatly declined, but it is still supposed to be of value as a mild stimulant and as a diaphoretic.

Copaiba or Copaiva. (Fr. *Copaiba*, Ger. *Copaiva*, Sp. *Copaiba.*)

This is a valuable drug, sometimes called balsam of copaiba, consisting chiefly of a resin and a volatile oil. It exudes from various trees of tropical America, in the neighbourhood of the Amazon, when an incision is made in the stems. It is of a pale yellowish colour, rather like honey in consistence, and possesses an aromatic and agreeable odour, although its taste is bitter. As a medicine it is used as a stimulant, and in cases when it is required to act powerfully upon the mucous membrane. It is sometimes given in the

form of pills to alleviate coughs. Copaiba is also employed in the manufacture of printers' ink.

Copal. (Fr. *Copal*, Ger. *Kopal*, Sp. *Goma copal.*)

The name applied to a gum resin obtained from various tropical trees, and of considerable value in the arts. It is exported largely from the East Indies, South America, and East Africa, especially Zanzibar. The best African copal is semi-fossil and found imbedded in the ground; it resembles amber in appearance and in some of its qualities. It is inflammable, insoluble in water, but soluble in alcohol and oil of turpentine if it has been previously melted for a short time. All kinds of copal are extensively employed in the manufacture of varnishes and lacquers of a pale colour.

Copalchi Bark. (Fr. *Écorce de copalche*, Ger. *Copalchirinde*, Sp. *Corteza de copalchi.*)

The bark of the *Croton niveus*, a shrub of Central America, much resembling cascarilla in its properties, and with a flavour slightly resembling that of mace. The bark is in quills about 2 feet in length. It contains a bitter alkaloid resembling quinine, and is often used as a substitute for cinchona.

Copper. (Fr. *Cuivre*, Ger. *Kupfer*, Sp. *Cobre.*)

The earliest metal known and worked, and valuable in the manufacture of bronze in the remotest ages. It is rarely found in a pure state, but the extraction from its ores is not a difficult process. The principal ores are copper pyrites, copper glance, and malachite. These are very widely distributed, and the smelting works of Swansea and its neighbourhood—the greatest centre of the process of smelting—draw supplies not only from Cornwall and Devonshire, but also from Spain, Portugal, and Australia. Copper has a reddish colour, takes a fine polish, and possesses a faint odour. When exposed to moist air it becomes greenish in colour, and communicates the same colour to a flame when held in it. It is hard, malleable, ductile, and tenacious, and one of the best known conductors of heat and electricity. It dissolves in nitric acid. Its specific gravity is 8.9.

The alloys of copper are of enormous importance in manufactures. The best known are bell-metal, brass, bronze, gun metal, and speculum metal. Sulphate of copper, formed into large blue crystals and known as blue vitriol or bluestone, is used in calico printing and electro plating, and in the manufacture of various pigments. Acetate of copper is commonly known as verdigris.

There are great deposits of copper in the United States, and the working of this metal has largely increased there during the last twenty years.

Copperas. (Fr. *Couperose, Vitriol vert*, Ger. *Eisenvitriol*, Sp. *Vitriolo marcial.*)

Sulphate of iron, or green vitriol. It is used for dyeing black, in the manufacture of inks, and also as a dressing for crops.

Copra. (Fr. *Coprah*, Ger. *Koprah*, Sp. *Copra.*)

The commercial name for the dried kernel of the cocoa nut when broken into small pieces. It is imported, mainly from Ceylon, for the sake of the cocoa nut oil that it contains and which is expressed from it.

Coprolites. (Fr. and Ger. *Coprolite*, Sp. *Coprolito.*)

The fossilised dung of certain extinct animals, chiefly of the lizard tribe. They are found in various strata, and occur in different shapes. Owing to the presence of phosphate of lime, coprolites have been largely used for manuring land and also in the preparation of artificial manures.

Coquilla Nuts. (Fr. *Noix de Coquille*, Ger. *Koquillnuss*, Sp. *Nuez de coquille.*)

The seeds of a South American palm —the *Attalea funifera*. These seeds are largely exported from South America, the wood being cut and polished, and then used in the manufacture of buttons, umbrella knobs, etc. The wood is hard, takes a high polish, and has a beautiful brown mottled appearance.

Coral. (Fr. *Corail*, Ger. *Koralle*, Sp. *Coral.*)

The name applied to the stony skeletons of certain marine animals belonging to the same class as the sea-anemone. The red coral used for making beads, necklaces, etc., is found

in the Mediterranean at a considerable depth. It is capable of taking a high polish, is very hard, and the finer qualities command high prices. It is fished for by means of nets.

Coralline. (Fr. *Coralline*, Ger. *Korallin*, Sp. *Coralline.*)

A red colouring substance resulting from the action of oxalic and sulphuric acids upon phenol. A substance, called aurin, or yellow corallin, is first produced, and then peonin, or red corallin, is obtained by heating aurin with alcoholic ammonia. Aurin is used by paper-stainers, and peonin is employed for printing fabrics and dyeing wools. By adding calcined magnesia to a solution of peonin a rich and durable turkey red is produced.

Cordite. (Fr., Ger., and Sp., *Cordite.*)

The explosive made principally from gun-cotton and nitro-glycerine, with the addition of vaseline. Nitro-glycerine is first mixed with one-sixth its weight of acetic ether, and gun cotton is afterwards added, the amount used being the same as the nitro-glycerine. The whole is mixed until it has the constitution of jelly. It is then compressed by machinery, cut into desired lengths, and converted into pliant threads. Various other processes are necessary before the cordite is ready for cartridges. Cordite is uninfluenced by moisture or by temperature up to 93° C.

Coriander. (Fr. *Coriandre*, Ger. *Koriander*, Sp. *Cilantro.*)

An annual plant of the Umbelliferae order, a native of S.E. Europe and the Levant, but now widely distributed. Its seeds are red and aromatic, and a volatile oil is obtained from them. The seeds are sometimes used in medicine, and domestically they are employed for flavouring curries and spirits, and in the manufacture of confectionery, etc.

Cork. (Fr. *Liège*, Ger. *Kork*, Sp. *Coacho.*)

The developed outer bark of the cork tree, the *Quercus suber*. This tree is grown largely in Spain and Portugal, from which countries the chief supplies are obtained, and also in Algeria and Tunis. It is not until the tree is 25 years old that the bark is cut, and fresh cuttings take place every eight or ten years, the tree itself living for about 150 years. The usual method of cutting the bark is to make longitudinal and transverse incisions, which admit of the cork being removed in semi-cylindrical pieces by means of a curved knife. Great care is required in the cutting so that the inner bark may not be injured. The detached pieces are soaked in water, pressed flat, dried, and superficially charred to remove any decayed parts and to conceal blemishes. They are then packed in bales for the market. Thousands of tons are annually imported into the United Kingdom. Besides being used for corking bottles and casks, cork is used for net floats, life-belts, and in the construction of life-boats. As it is impermeable to water it is employed for the inner soles of shoes. There is always great waste in cutting cork, and a use has been lately found for this waste in the manufacture of linoleum.

Corn. (Fr. *Blé, Cereales*, Ger. *Getreide, Korn*, Sp. *Grano.*)

The general name applied to food grains. In England the word generally signifies wheat, and in the United States maize, but in both countries rye, barley, and oats are included under the name corn. The different kinds are noticed under separate headings.

Cornel. (Fr. *Cornouille*, Ger. *Cornel*, Sp. *Cornejo.*)

The fruit of the *Cornus mas*, also called the Cornelian cherry. It is the size of a small plum, and generally of a shining red colour. When ripe its taste resembles that of wine, and the fruit is used when preserved in the manufacture of various kinds of confectionery. In Turkey it is employed in flavouring sherbet. The wood of the cornel tree is hard and tough, and in much request by turners, joiners, and instrument makers.

Coromandel Wood. (Fr. *Bois de Coromandel*, Ger. *Coromandelholz*, Sp. *Madera de Coromandel.*)

The wood of the *Diospyrus hirsuta*, imported in logs and planks from India. It is employed in cabinet making.

Corozo. (Fr., Ger., and Sp., *Coroza.*)

A palm tree, *Phytelephas macrocarpa*, which grows in Central and South America. Its fruit is known as Corozo

nuts, and these nuts contain a milky liquid which, when condensed, acquires a hardness almost equal to that of ivory. On this account the nuts are often called "vegetable ivory nuts." The milky substance, when hardened, is used for the manufacture of buttons, collar studs, sleeve links, and similar small articles. Supplies are obtained principally from Ecuador and Costa Rica.

Corrosive Sublimate. (Fr. *Deutochlorure de mercure, Sublimé corrosif*, Ger. *Quecksilberchlorid*, Sp. *Cloruro de mercurio.*)

The common name for bichloride of mercury, or mercuric chloride, a compound of chloride and mercury. It is a deadly poison, but is used as a preservative.

Corundum. (Fr., Ger., and Sp., *Corindon.*)

The name of a mineral species, including a variety of precious stones, such as the ruby, the sapphire, and the topaz, but confined commercially to the crystalline forms of emery. It is composed essentially of pure alumina, and is extremely hard, in this respect being inferior to the diamond alone. It is in great request for grinding and polishing machinery, plate glass, etc. Corundum is found abundantly in Asia Minor, India, China, and the United States.

Coto Bark. (Fr. *Écorce de coto*, Ger. *Coto-Rinde*, Sp. *Corteza de Coto.*)

A medicinal bark obtained from certain trees of tropical South America. Its use is very limited.

Cotton. (Fr. *Coton*, Ger. *Baumwolle*, Sp. *Algodon.*)

One of the most important of vegetable fibres, cultivated extensively in various parts of the world up to the 36th parallel of latitude. It is obtained from the seeds of various species of *Gossypium*, a genus of plants belonging to the mallow family, but there are really not more than three which yield the cotton of commerce. The plants vary in size according to climatic conditions, and the flowers are rich and showy. The fruit is a 3 or 5 celled capsule, bursting open when ripe, and containing numerous seeds which are covered with the beautiful filaments known as cotton, generally white in colour. The seeds are picked and the fibre is separated from them by a process called "ginning." The cotton is afterwards compressed by a screw or by a hydraulic press into bales, and when these have been secured by iron hoops it is ready for the market. The bales differ in size, weighing from 300 to 600 lbs. each, according to the country from which they come. The seeds are pressed for the purpose of extracting a bland oil from them, and the residuary cake is useful for feeding cattle.

As cotton is valued according to the special characteristics it possesses and its peculiar adaptability to the uses for which it is required, various classifications have been made. American cotton is divided into the following series: (1) fine, (2) good, (3) good fair, (4) fully fair, (5) middling fair, (6) good middling, (7) middling, (8) low middling, (9) good ordinary, (10) ordinary, and (11) inferior. Samples of each of these classes are kept at the offices of the Liverpool Cotton-brokers' Association for comparison in case of disputes arising, and also for reference. Another division is based upon the places from which cotton is obtained:—

(1) *American cotton.*—Sea Island or Long Georgia supplies the silky, regular, long staple cotton, the finest and costliest grown. Upland Georgia and Mobile is soft and rather short in the staple. Texas is finer in the staple than Mobile, but less bright in appearance. Of all the American cottons New Orleans is the best and most regular.

(2) *Brazilian cotton.*—Generally this is harsh in staple and gives a wiry feel to yarns into whose composition it enters.

(3) *Egyptian.* The brown is soft and silky, and the white is generally hard and harsh.

(4) *Turkey and Greece.*—These are harsh in staple and the fibres are irregularly twisted.

(5) *Peruvian.*—There are both hard and soft varieties. The soft is much like the cotton of New Orleans, and the hard is usefully mixed with Brazilian.

(6) *East Indian.*—Of a poor character, and containing a large quantity of round and flat fibres.

The principal supply of cotton is derived from the United States, though there are very large imports from India.

Among the other countries which send cotton to the United Kingdom Egypt is well ahead as regards quantity.

England has held a pre-eminent position in the manufacture of cotton goods ever since the trade was transferred from India to Europe. The statistics given by the Board of Trade show the extent of the work done in cotton and cotton goods, and this is about equal to that of the rest of the world collectively.

The refuse of the mills in the processes of cotton manufacture is called cotton waste. It consists mainly of the strippings from the carding machines and the sweepings from the floors of the card rooms. Millions of pounds are annually used in the manufacture of counterpanes, common carpets, cotton wicks, wadding, and twine. The waste supplied by the mills in England is insufficient for all demands, and a considerable quantity is imported every year.

Cowslip. (Fr. *Primevère*, Ger. *Schlüsselblume*, Sp. *Primula de jardin.*)

A common plant in many parts of England, and in other parts of Europe. Its flowers are somewhat like those of the primrose. These flowers are used in the manufacture of cowslip wine, when they are fermented with sugar.

Crab. (Fr. *Crabe, Ecrevisse*, Ger. *Krebs*, Sp. *Cangrejo.*)

The well-known edible shell fish, belonging to the same family as the lobster and the cray fish. The crab is littoral in its habits, and several millions are taken annually off the coasts of England and Wales.

Cranberry. (Fr. *Canneberge*, Ger. *Moosbeere, Preiselbeere*, Sp. *Arándano rojo.*)

The name of a small, slender, creeping evergreen shrub, belonging to the order of plants known as *Vacciniaceae.* There are three species in Europe and Northern Asia. The cranberry of the United States and Canada is larger than the European plant. The berries, which have a sharp acid taste, are valuable for the making of tarts and preserves, and on account of their anti-scorbutic properties are much used on board ship. Wine is made from them in Siberia, and a beverage derived from them is sold in Russia. Since the draining of the fens the cranberry has not been much cultivated in England and our chief imports are from Canada.

Crape. (Fr. *Crêpe*, Ger. *Crepon, Krepp*, Sp. *Cendal, Crespon.*)

The thin gauze-like fabric made from raw silk, gummed and twisted at the mill, and from which all the gloss has been removed. The nature of its peculiar manufacture has been preserved as a close secret by the European makers. It is usually dyed black, and is used for mourning. England is the principal country in which crape is made, though Lyons has no mean trade in the article. Chinese and Japanese crapes are manufactured in a different manner, and are often white or coloured. These are then used for shawls, scarfs, etc. An imitation of crape, made from cotton, has been attempted in Lancashire.

Cream. (Fr. *Crême*, Ger. *Rahm*, Sp. *Crema, Nata.*)

The fat of milk which exists in minute globules in new milk. Being lighter than the milk itself the cream rises to the surface, and overspreads the whole. It is generally of a yellowish colour. Machines, called cream separators, have been devised for dividing the cream from the milk with greater speed than can be done when the operation is left to nature, and also for extracting the whole instead of a part. Cream is the source of butter, and is a most important article of commerce. A considerable trade is carried on in the manufacture of various kinds of creams, the principal of which are :—

1. Devonshire cream : This is prepared by heating new milk in wide pans after it has been allowed to stand for a day. Care must be taken that the milk does not boil. After standing again the cream is skimmed off and sugar added.

2. Whipped cream : This is made by beating up new milk or cream with the white of eggs.

3. Vanilla cream : When whipped cream is sugared and flavoured it is called Vanilla cream.

4. Cream cheese : Rich cream is first tied up in a clean wet cloth, kept in a cool place for several days, then transferred to a finer cloth, and afterwards placed in a mould.

Cream of Tartar. (Fr. *Crême de tartre, Bitartrate de potasse*, Ger. *Cremortartari, Kaliumbitartrat*, Sp. *Cremor de tártaro.*)

The crystallized bitartrate of potash. It occurs naturally in grape juice, and as it is insoluble in alcohol it is gradually deposited as argol. The argol is dissolved in boiling water, and the solution is treated with charcoal to remove the colouring matter. On being allowed to cool the cream of tartar separates in white crystals. Its chemical symbol is $KHC_4H_4O_6$. For a long time it was difficult to obtain this substance in anything like a pure state, but that has been overcome by degrees. Cream of tartar is used medicinally as a diuretic and purgative.

Creasote. (Fr. *Créosote*, Ger. *Kreosot*, Sp. *Creosota.*)

The antiseptic oily substance obtained from the destructive distillation of wood. The creasote of commerce, however, is obtained from the distillation of coal tar. It is much used in the preservation of meats, etc., and it prevents the rotting of railway sleepers or other kinds of wood likely to be exposed to an excess of wet. Medicinally, wood creasote is used to allay local pain, especially tooth-ache.

Cretonne. (Fr., Ger., and Sp., *Cretonne.*)

The name originally applied to a particular white cloth of French manufacture. It is now used to denote printed cotton fabrics which are employed for making curtains and furniture covers, cretonne having taken the place of chintz.

Croton Oil. (Fr. *Huile de croton*, Ger. *Purgier-körneröl, Krotonöl*, Sp. *Olio de Croton.*)

An extremely powerful purgative oil expressed from the seeds of the *Croton Tiglium*, a plant grown in many parts of the West Indies, and in South Africa. The oil is of a brownish colour, and has an extremely rancid and nauseous odour. Owing to its very drastic properties, great care is required in its use. Externally croton oil is employed as a liniment.

Crown Glass. (See *Glass.*)

Crucible. (Fr. *Creuset*, Ger. *Schmelztiegel*, Sp. *Criosol.*)

A vessel used for fusing metals, glass, etc. Crucibles are generally made of materials capable of being exposed to high temperatures. The most common are formed of porcelain or clay, or of a mixture of plumbago and clay. In certain cases platinum, gold, silver, iron, and lime are used.

Cryolite. (Fr., Ger., and Sp., *Cryolite.*)

A double fluoride of sodium and aluminium, occurring in large deposits in Greenland, and also found in the Ural Mountains. It was at one time the principal source of aluminium. Now it is chiefly valuable on account of the alum and bicarbonate of soda obtained from it. Cryolite is also employed in the manufacture of glass.

Cubebs. (Fr. *Cubébes*, Ger. *Cubeben*, Sp. *Cubebas.*)

Otherwise cubeb pepper, the dried berries of the *Piper cubeba*, or *Cubeba officinalis*, a climbing shrub of the East Indies. The seeds are about the same size as those of black pepper, and possess a peculiar odour and warm taste like that of camphor. They contain a volatile oil, a substance known as cubebin, and various resinous bodies, one of which is cubebic acid. Cubebs are again being used medicinally after having been discarded for a long period. They are valuable in certain stomachic complaints, and also in cases of indigestion.

Cucumber. (Fr. *Concombre*, Ger. *Gurke*, Sp. *Cohombro, Pepino.*)

The well-known tender annual table vegetable, *Cucumis sativus*, belonging to the gourd family. In the south of England and in equally warm localities it is grown in the open air, but it requires to be protected and kept in warmer earth as the latitude increases. When the fruit is nearly ripe it comes away from the stalk and gives out its seed and juice, the latter containing a powerful drug. The cucumber is largely used as a salad, whilst the young one, called gherkins, are pickled. There is an immense business done in cucumbers at Sandy, in Bedfordshire.

Cudbear. (Fr. *Orseille*, Ger. *Färberflechte*, Sp. *Orchilla.*)

A preparation of archil, made in the form of a brownish red powder. It is very useful to the wool-dyer, as giving a brilliant bloom, but it is somewhat fugitive.

Culilaban Bark. (Fr. *Écorce de culilabane*, Ger. *Culilabanrinde*, Sp. *Corteza de Culilaban.*)

An aromatic bark, also called clove bark, obtained from the *Cinnamomum culilaban*, a tree of the same genus as the cinnamon. It is obtained from the East Indies. The odour of the bark resembles that of nutmegs and cloves. Its medicinal use is confined to cases of diarrhœa and indigestion.

Cummin. (Fr. *Cumin*, Ger. *Römischer Kümmel*, Sp. *Comino.*)

A plant resembling the fennel, o the order *Umbelliferae*, cultivated in southern Europe, North Africa, and India. The cummin seeds are the fruit of the *Cummin cyminum*, the properties of which are similar to those of the caraway seeds, but somewhat stronger. The Dutch are said to mix cummin with their cheese, and in the north of Europe it is often added to bread. At one time used as a medicine it is now employed only by veterinary surgeons. Morocco is the chief exporting country.

Curacoa. (Fr. *Curaçao*, Ger. *Kurasso, Pomeranzen-liqueur*, Sp. *Curacoa.*

The liqueur manufactured largely in Holland, principally at Amsterdam, from the dried rind of the Curacoa oranges. These oranges are obtained from the West India Island Curacoa, a Dutch possession in the Gulf of Maracaybo. The rind is steeped in water, and afterwards distilled with spirit and water. Sugar and Jamaica rum are added to the residue. An imitation of curacoa is obtained from the rind of bitter oranges and whiskey.

Currants. (Fr. *Raisins, Raisins de Corinthe*, Ger. *Johannisbeeren, Korinthenbeeren*, Sp. *Grosellas, Pasas de Corinto.*)

The common name for various species of plants of the genus *Ribes*. The best variety for jellies, wines, and preserves is the red currant, with its white variation, though the black currant is much prized. The grape currant is the fruit of the Corinth vine, a variety of the ordinary vine cultivated in the Ionian Islands. In certain districts of Greece a very sweet wine is made from the fruit, but the grapes are cultivated mainly for export, Greece possessing practically a monopoly. The kinds distinguished in commerce are Cephalonia Gulf, Patras, Vastizza, and Zante. Great Britain imposes a customs duty of 2s. per cwt. on imported currants.

Cutch.

(See *Catechu.*)

Cutlery. (Fr. *Coutellerie*, Ger. *Messerschmiedwaren*, Sp. *Cuchilleria.*)

The general name for cutting instruments such as knives, forks, scissors, razors, etc. In the manufacture of cutlery France and Germany are now strong competitors with England in foreign markets, and the trade of Sheffield, the centre of the manufacture in the United Kingdom, has been much affected. In the United States also, England has a most formidable competitor. In France the chief towns engaged in cutlery manufacture are Thiers, Langres, Nogent, Châtellevault, and Paris. The finest surgical instruments are made in Paris. In Germany the principal centres are Solingen, Remscheld, Suhl, and Schmalkalden. In the manufacture of razors Sweden has become especially famous.

Damask. (Fr. *Damas*, Ger. *Damast*, Sp. *Damasco.*)

The name given to certain fabrics, first worn at Damascus, into which elaborate patterns are introduced. The production of the pattern depends upon the method adopted in weaving, the Jacquard loom being the machine employed. There are silk, woollen, linen, and cotton damasks, but the chief are linen, and they are used for table-covers, napkins, furniture covers, etc. In Great Britain the principal seats of the linen manufacture are Barnsley in England, Dunfermline in Scotland, and Belfast in Ireland. Cotton damasks are produced at Manchester, Glasgow, and Paisley, and woollen damasks at Halifax and Bradford. Silk damasks are made in the neighbourhood of London.

Dammar. (Fr. *Damar*, Ger. *Dammar*, Sp. *Dammar.*)

Also known as gum cat's eye. The word is an Eastern one, signifying resin, but the dammar resin of commerce is the produce of certain pine trees. These trees are found in the East Indies, New Guinea, and New Zealand. The gum is obtained by making incisions in the bark of the trees, and is beautifully clear and

almost transparent. The resin is also found in many places in a fossil condition, and this species is of the greatest commercial value. Soluble in cold ether, dammar is largely employed in the preparation of transparent and rapidly drying varnishes. Singapore is the chief exporting town of this article.

Damson. (Fr. *Prune de Damas*, Ger. *Damaszenerpflaume*, Sp. *Ciruela damasquino.*)

The small oval variety of the common plum, much used for making preserves. The damson tree grows to a considerable height, and is exceedingly fruitful. The fruit is variously coloured, dark purple, blue, black, and yellow. A native of Damascus, the damson tree is now found in various parts of the world.

Dandelion. (Fr. *Dent de lion*, Ger. *Löwenzahn*, Sp. *Amargon*, *Diente de leon.*)

A plant belonging to the natural order *Compositae*, common in all temperate regions. The name, lion's tooth, is given to it on account of the formation of its leaves. Dandelion abounds with a milky juice, of which the principal constituents are resin, inulin, sugar, and a peculiar crystalline principle taraxacin. This juice has a bitter taste, but is valuable medicinally as a tonic and in liver troubles. The root, when ground, is often mixed with coffee and chocolate, and is sometimes used as a substitute for coffee.

Date Palm. (Fr. *Dattier*, Ger. *Dattelpalme*, Sp. *Palma Palmera.*)

A species of palm cultivated in immense quantities all over northern Africa, western Asia, and southern Europe. The fruit is in many instances used as the principal food of the inhabitants of the countries in which it grows, and when dried, the dates are exported from Egypt, Turkey, and Morocco. The varieties are exceedingly numerous, depending upon the shape, size, quality, time of ripening, etc. From the fibre of the date palm rope is made, while the sap of the tree gives an intoxicating beverage known as lagbi. Sugar is also made from the sap, and consumed in India.

Date Plum.

A tropical tree belonging to the ebony order, valuable on account of its timber and its fruit. From the fruit, when pounded, fermented and distilled beverages are made. The bark is bitter, and is employed medicinally in cases of cholera and diarrhœa.

Deals. (Fr. *Bois de sapin*, Ger. *Tannenbretter*, Sp. *Tablas.*)

The name applied to particular sizes of pine wood when exported from the Baltic ports, though properly it should refer to any thicknesses in which timber is cut up. Deals are 3 inches thick and 9 inches wide. They are sold by the hundred, each hundred containing 120 pieces. In trade returns, deals are placed under the head of sawn timber.

Deer. (Fr. *Cerfs*, Ger. *Reh*, *Rotwild*, Sp. *Corzo.*)

A family of ruminating mammals belonging to the order of hoofed quadrupeds. They are distinguished from other ruminants by the nature of their horns, or antlers, which are bony throughout, and are annually shed and reproduced. Deer are very widely distributed, and very many species are known, though none are found in Australia or Africa. The flesh appears in the market as venison, the horns are valuable in the manufacture of cutlery goods, and the skins are employed for making robes, rugs, and trimmings. India and South America are the principal sources from which Great Britain draws its supplies.

Dextrine. (Fr. *Dextrine*, Ger. *Dextrin*. Sp. *Dextrine.*)

Also known as British gum. It is prepared from starch by the action of dilute acids at a high temperature, and also by the action of diàstase. Its chemical symbol is $C_6H_{10}0_5$, and it closely resembles starch, but it can be distinguished from that substance by the fact that it is not turned blue by iodine. Dextrine is much used as a substitute for gum arabic in calico printing, and also as a mucilage for stiffening fabrics. It serves as a coating for adhesive stamps, envelopes, etc.

Diamond. (Fr. *Diamant*, Ger. *Diamant*, Sp. *Diamante.*)

The most brilliant of all precious stones, though less highly valued than the ruby. It is the natural form of crystallized carbon, and is well known by its peculiar lustre. The colourless stones are generally the most prized, though a rare colouring may give a fictitious value to those of inferior

quality. Much depends upon the cutting, and this highly skilled industry is carried on principally at Amsterdam.

The diamond is harder than any other mineral, and this hardness is one of its most distinguishing features. Only a diamond will readily scratch a ruby or a sapphire. In spite of its hardness, however, it is exceedingly brittle. Its spécific gravity is 3·5. Since the chemical composition of this precious stone is so well known, many efforts have been made to produce artificial diamonds, but little success has attended the experiments owing to the expense and the danger involved, and the particular experiments of Mr. Hannay, of Glasgow, made in 1880, have not been repeated.

India, Brazil, and South Africa, especially the last named, are the principal diamond producing countries, and it is believed that the precious stones exist in Australia.

An imperfect variety of diamond is bort, or boart, which is not capable of being used as an ornament, but is employed as an abrading agent when ground. Another variety is carbonado, black and opaque, found only in Brazil. Its density is less than that of the crystallized diamond, but its hardness is greater. Hence it is used for mounting in the steel heads of rotary diamond drills for rock-boring.

Diaper. (Fr. *Toile ouvrée*, Ger. *Hangenleinwand*, Sp. *Lienzo.*)

A variety of linen or other cloth, generally figured with some pattern. It is produced by a process of twilling. Diaper is mainly used for table-linen, towels, etc.

Digitalis. (Fr. *Digitale*, Ger. *Fingerhut*, Sp. *Dedal.*)

A genus of plants of the natural order *Scrophulariaceae*, natives chiefly of Europe and the north of Asia. One species only is found in Britain, the *digitalis purpurea*, or common foxglove. The leaves of the plant are useful in medicine, especially in cases of heart disease. In large doses it is poisonous and great care is required in its administration. The active principle of the tincture obtained from the leaves is digitaline.

Dill. (Fr. *Anet*, Ger. *Dillkrant*, Sp. *Aneto.*)

An aromatic plant, common in the East, in South Africa, and in the Mediterranean countries. The seeds are extensively used for flavouring pickles, sauces, etc., and medicinally they are employed as a remedy for flatulence and, in the shape of dill water, for soothing infants. A volatile oil is obtained from the seeds by distillation, which is useful in scenting soaps.

Dimity. (Fr. *Basin*, Ger. *Dimiti, Barchent*, Sp. *Bombasi, Fustan.*)

A cotton fabric, stout and figured, used principally for bed-hangings and window curtains. It owes its name to the fact that it was originally made at Damietta, in Egypt. At one time dimity was white or of a single colour, but now there are variegated styles in vogue.

Dividivi. (Fr. *Libidibi*, Ger. *Dibidibi, Dividivi*, Sp. *Los Dividos.*)

The twisted pods of the *Caesalpinia coriaria*, a great leguminous tree, native of South America. They are very rich in tannin, and are extensively imported into Great Britain from South America, especially Venezuela, for the use of tanners and dyers.

Dogwood. (Fr. *Cornouille*, Ger. *Der rote Hornstrauch*, Sp. *Corneta.*)

Also called Dogberry, a species of cornel tree. The wood is very hard, and is largely used for making the handles of tools, cogs for wheels, etc., while the young branches are cut to make skewers. An oil is extracted from the tree, which resembles olive oil, while the bark is employed medicinally as a purgative and a febrifuge. The best charcoal for the manufacture of gunpowder is produced by burning dogwood.

Dogs. (Fr. *Chiens*, Ger. *Hunde*, Sp. *Perros.*)

There is a very large trade carried on in dogs of various breeds, but it is the skin of the dog that is chiefly valued as a commercial product. The skins of the larger species can be tanned for boots, shoes, and riding gloves, while those of the smaller ones are used for the manufacture of lighter gloves. In China dogs are reared on a large scale for the sake of their skins, some of the long haired ones being turned into mats, coats, etc. The chief exporting town is New Chang, the value of the skins being estimated at about £50,000 per annum.

Dragon's Blood. (Fr. *Sang-dragon*, Ger. *Drachenblut*, Sp. *Sangre de drago.*)

Also called gum dragon. The resinous exudation of different plants, principally the *Pterocarpus draco* of South America, and the red sandal tree of the East Indies. It is a dark reddish-brown substance, carmine red when pulverized, without either taste or smell. From Sumatra it is exported in sticks wrapped in palm leaves. Dragon's blood is soluble in oils and turpentine, and forms a part of the most useful varnishes. It is also used for dyeing horn the colour of tortoise shell, for staining marble, for making certain tinctures, and for the manufacture of various kinds of tooth powder.

Dugong. (Fr., Ger., and Sp. *Dugong.*)

A marine animal, of the genus Sirenia, allied in some respects to the whale. It is found in the Indian and Pacific Oceans. From its fat an oil is boiled down, which has the peculiar virtue of not turning rancid, and which is medicinally employed as a substitute for cod-liver oil.

Durra. (Fr., Ger., and Sp. *Durra.*)

A genus of grasses, also called durra millet, Indian millet, and sorgho grass. They are extensively cultivated in Africa and the East Indies. The common durra (*Holcus Sorghum*) is a coarse strong grass, having a round grain, rather larger than a mustard seed. The produce yielded is very abundant, even rivalling maize, and when ground is largely used in Africa as a substitute for flour in making bread, and for rice in making puddings, etc. The leaves of the durra, as well as the grain, make excellent food for cattle. The trade in the grain and the leaves has rapidly declined during the past half century.

Dye-stuffs. (Fr. *Matières colorantes*, Ger. *Farbstoffe*, Sp. *Tinturas.*)

The materials used by dyers for producing colours upon textiles and other substances. Those dyes which produce their effect without the aid of any other substance are called substantive dyes, while those which require an adjunct or mordant are called adjective dyes. The chief mordants used are the various metallic salts, especially those of tin and iron. The principal dye-stuffs are noticed under separate headings, as well as their principal sources, animal, vegetable, or mineral. Artificial dye-stuffs are now derived from coal-tar, especially the aniline colours.

Dynamite. (Fr. *Dynamite*, Ger. *Dynamit*, Sp. *Dynamite.*)

The powerful explosive first made of practical and commercial importance by Mr. Alfred Nobel, in 1867. It is composed of a mixture of nitro-glycerine and kieselguhr, a siliceous infusorial earth found chiefly in Germany. Nitro-glycerine was first obtained in 1846 by dropping glycerine into a mixture of strong nitric and sulphuric acids at a low temperature, but its use was attended with so much danger that it was valueless until Nobel's discovery. One part by weight of kieselguhr is mixed with three parts of nitro-glycerine, kneaded into a paste, and passed through a sieve. When thus prepared dynamite is a loose powder of a reddish brown colour. Another method of preparation is to replace the kieselguhr with nitrate of potash and carbon, and to mix the three substances in the following proportions:—71 parts of nitrate of potash, 18 parts of nitro-glycerine, and 10 parts of powdered charocal. One part of paraffin is added to the whole. The result is a black moist powder, rather drier than the dynamite produced by the first method. Dynamite is made up in paper-cased cartridges, either for use or for storage. It can be burned without danger in small quantities, and gives out a yellow flame. When exploded with a detonating fuse it is very violent in its effect. For this reason it is much employed in quarrying, in mining, and in all heavy work where it is necessary to remove or break up great masses or weights. The amount of work performed by dynamite is much greater than that done by either gunpowder or gun-cotton, and it is now generally used by the artillery of the armies of most countries. It loses very little of its power when under water, and for that reason is extensively employed in submarine operations.

Ear-Shell.

A genus of molluscs, belonging to the order *Haliotidae*. The shell is ear-shaped, and is pierced on the margin

with a series of holes. On account of the beautiful tints of their linings these shells are much used for inlaying work and for ornamentation generally. As many as eighty species are known, the genus having a very wide distribution extending from the Channel Islands southwards.

Earthenware. (Fr. *Vaisselle de terre*, Ger. *Irdenes Geschirr*, Sp. *Vaso de barro.*)

A general name for cheap crockery or ordinary pottery ware. (*See Pottery*).

Eau de Cologne. (Fr. *Eau de Cologne*, Ger. *Kölnisches-Wasser*, Sp. *Agua de Cologne.*)

The celebrated perfume first prepared by Johann Maria Farina, an Italian, who settled in Cologne in the early part of the 18th century. For many years the process of its manufacture was kept a profound secret, but now the article is prepared not only in Germany, but also in Great Britain, the difference between the two preparations being hardly discoverable. Eau de Cologne is made from the essential oils obtained from each of the following trees belonging to the orange tribe, viz., citron, orange, bergamot, neroli, and rosemary, added to a certain quantity of rectified spirits. An extract of geranium flowers is sometimes added. The ingredients are well mixed by frequent agitation, and allowed to stand for two months. It is then ready to be put into flasks and bottles for sale.

Ebonite. (Fr., Ger., and Sp., *Ebonite.*)

A species of vulcanised rubber, prepared at a very high temperature with sulphur, exposed to pressure, and polished. It is used in the manufacture of various small articles such as toys.

Ebony. (Fr. *Ébène*, Ger. *Ebenholz*, Sp. *Ebano.*)

A very hard wood, heavy and deep black in colour. It is obtained from various trees of the order *Ebenaceae*. It is only the heart wood, or the inner part of the trunk, that yields the black ebony, the outer part being white and soft. The logs cut are often as long as 10 feet, and have a thickness of 2 feet. It is the usual practice to immerse the wood in water, after it has been cut, for several months in order to increase its hardness. The best ebony comes from Mauritius, and the next in value is exported from Ceylon. It is used largely by cabinet makers and turners, and piano keys are often made from it. Many small articles, such as door-knobs, knife handles, etc., are likewise made out of this wood.

Edge Tools. (Fr. *Instruments tranchants*, Ger. *Schneidende Werkzeug*, Sp. *Instrumente cortante.*)

The general name applied to cutting instruments of metal, such as axes, chisels, knives, etc. The great centres of the edge tool industry are Sheffield and Birmingham, but the trade is now carried on extensively abroad. In the Board of Trade returns they are included under the heading "Hardware and Cutlery."

Eel. (Fr. *Anguille*, Ger. *Aal*, Sp. *Anguila.*)

The soft-finned bony fish, distinguished by its serpent-like form. Eels are widely distributed over all the fresh waters and seas of the temperate and tropical zones. They are largely consumed in England, fresh and pickled, and there is a considerable export trade done by Holland to this country, most of the fish being brought over in a live state.

Eggs. (Fr. *Œufs*, Ger. *Eier*, Sp. *Ovar.*)

The ova of birds. The eggs of fowls, which comprise about 80 per cent. of those used, enter largely into commerce and are imported both as an article of food and for use in manufactures. Great Britain imports them from most European countries and from various of her colonies. The dried white of eggs, or egg albumen, is a substance largely used in calico printing and in photography.

Eider Down. (Fr. *Édredon*, Ger. *Eiderdaunen*, Sp. *Ederdon.*)

The heat feathers obtained from the nests of the Eider duck, noted for their softness, lightness, and warmth. The bird itself is a native of the frozen coasts of northern Europe and America and the principal supplies of eider down are obtained from Greenland, Iceland, Sweden, and Norway. It is used for making quilts, and coverlets, and for padding dressing gowns.

Ejoo Fibre.

The fibre obtained from the *Arenga saccharifera*, a species of palm which

grows in the East Indies. It is dark in colour and like horsehair in texture. On account of its durability it is often made into cordage and cables.

Elaterium. (Fr. *Elaterin*, Ger. *Elaterium*, Sp. *Elaterio.*)

A powerful purgative drug, obtained from the fruit of the squirting cucumber, a native of the Mediterranean countries. It is prepared by allowing the juice of the ripe fruit to stand and afterwards collecting the sediment. When fresh it is of a pale green colour, but this colour disappears after a time. Its activity as a drug depends upon the presence of elaterin, the most powerful purgative known. It acts also as an irritant on the eyes and fingers of persons handling it.

Elecampane. (Fr. *Aunée*, Ger. *Alantwurzel*, Sp. *Énula campana.*)

The bitter and aromatic roots of the *Inula Helenium*, a native of damp meadows in the south of Europe, and now grown in parts of North America. The powdered root is used medicinally as a stimulant, and as it possesses a peculiar violet-like odour it is employed in the manufacture of perfume.

Elemi. (Fr. *Résine élémi*, Ger. *Elemi*, Sp. *Elemi.*)

A fragrant resinous substance obtained from different trees of the myrrh order. At one time there were various varieties of elemi in use, Mexican, Brazilian, and Mauritius, but the only one now in demand comes from Manilla. This substance, when pure and fresh, is colourless and has the consistence of honey, but when mixed with impurities it has a yellow tint. It is used in making ointments and plasters, and on account of its agreeable odour it enters into the composition of incense.

Elm. (Fr. *Orme*, Ger. *Ulme*, Sp. *Olmo.*)

A genus of trees belonging to the order *Ulmaceae*. The trees grow in all parts of Europe, and there are many fine varieties in England. The wood of the English elm is valuable on account of its strength, toughness, and durability. It is not so liable to split as other timber, and resists the action of water. Hence it is much employed in shipbuilding and for making foundation piles. The common and the Cornish elms are considered to give the best timber.

Emerald. (Fr. *Emeraude*, Ger. *Smaragd*, Sp. *Esmerelda.*)

A highly valued precious stone, a variety of the beryl, and differing from it only in the brilliancy of its colour. This colour is a velvety green, generally supposed to be due to the presence of oxide of chromium, though it is not accurately known to what it is ascribable. The emerald is composed of silica, alumina, glucina, and minute proportions of chromium, magnesia, and carbonate of lime. The finest specimens have been obtained from Colombia and Venezuela, while inferior ones are found in various parts of Europe. When taken from the mine the emerald is soft, and can be easily reduced to powder, but it becomes hard by exposure to the air for a few days. Emerald copper is a beautiful and rare emerald-green mineral, sometimes known as dioptase, found in the Ural mountains.

Emery. (Fr. *Émeri*, Ger. *Körner-Smirgel*, Sp. *Emeri.*)

An impure dark-coloured variety of corundum, the colour being due to the presence of oxide of iron. It occurs in large masses in the Grecian Archipelago, in Asia Minor, and in Massachusetts. On account of its hardness emery is extensively employed for grinding, cutting, and polishing plate glass, flint glass, gems, jewels, edge-tools, etc. Before use it is reduced to a fine powder. Emery wheels made for the purposes of grinding, the main ingredient of which is emery, and emery cloths are composed of emery spread over a glued surface of calico or other substance. For cutting and polishing in lapidary work emery dust is laid on the edge of iron and lead wheels.

Endive. (Fr. *Endive*, Ger. *Endivie*, Sp. *Endibia.*)

An annual plant of the same order as chicory. It is a native of China, but grows well in English gardens. Its leaves are much used as a salad.

Ergot. (Fr. *Ergot de seigle*, Ger. *Mutterkorn*, Sp. *Ergoteo.*)

A powerful medicinal agent obtained chiefly from the seed of rye or wheat by the action of a fungus which changes the appearance and constitution of the grain. The ergot producing fungus is found in other grasses, but it does

not produce such characteristic effects as upon rye. Its activity is ascribed to the presence of a fixed oil, ergotine. The chief exporting countries are Germany and Russia.

Ermine. (Fr. *Hermine*, Ger. *Hermelin*, Sp. *Armiño*.)

The name of a carnivorous mammal belonging to the weasel family. The animal is about 10 inches long and has a tail of 3 or 4 inches in length. Its colour in summer is pale brown with a reddish tint, but in winter its fur changes to a beautiful white. This white fur has long been used for trimming the robes of state dignitaries. The ermine is widely distributed through the northern parts of Europe, Asia, and America, and the skins are imported from Norway, Lapland, Siberia, and the Hudson Bay territories.

Esparto. (Fr. *Sparte*, Ger. *Esparto*, *Spartogras*, Sp. *Esparto*.)

A species of grasses found in the various countries bordering on the Mediterranean Sea. They have long been used for the manufacture of carpets, ropes, baskets, nets, etc., but their chief application in modern times has been for paper-making. There are very large exports from Algiers to Great Britain, and it is estimated that this country takes altogether over 150,000 tons per annum. The grass grows wild, and does not require much rain. Owing to waste and destruction in cutting and pulling up the plant, governmental regulations have recently been issued both in Algiers and Spain as to its cultivation and treatment.

Essential Oils.

(See *Oils*.)

Ether. (Fr. *Éther*, Ger. *Æther*, Sp. *Eter*.)

A colourless and very volatile liquid, composed of carbon, oxygen, and hydrogen. Its chemical symbol is $(C_2H_5)_2O$. It is prepared by heating alcohol with sulphuric acid in the following manner. The alcohol is placed in a retort, and an equal volume of sulphuric acid is added. The mixture of the liquids develops heat, and when the temperature is further raised ether vapour passes over with a proportion of alcohol. By increasing the amount of alcohol and subsequent distillation ether is produced.

Ether possesses an agreeable odour and a somewhat fiery taste. It is highly inflammable, and when its vapour is mixed with air an explosive mixture is formed. It volatilizes spontaneously when unconfined, and this action takes place so rapidly that intense cold is produced. Hence its common use in freezing mixtures and freezing machines. It is one of the best solvents of fats, resins, alkaloids, etc., and is much employed in chemical analysis for the solution and separation of oils from other organic matters. When inhaled it produces temporary insensibility, and is often used as an anaesthetic, being sometimes preferred to chloroform owing to the absence of any of the ill-effects produced by the latter.

When imported into Great Britain, chiefly from Germany, acetic ether pays a duty of 1s. 11d. per lb., butyric ether, 16s. 5d. per gallon, and sulphuric ether, £1 7s. 5d. per gallon.

Eucalyptus. (Fr. *Eucalypte*, Ger. *Eukalyptus*, Sp. *Eucalypte*.)

A genus of plants belonging to the myrtle family, of which there are about 150 species. They form the most characteristic vegetation of Australia, the trees being remarkable for their great height. The cultivation has been introduced into Africa and Central America. They possess an aromatic odour of a peculiar character, and this is their main peculiarity. A resinous exudation is obtained from the eucalyptus tree, and this is used medicinally as an antiseptic, its camphor-like smell giving it a virtue of its own. A volatile oil is obtained from several species by distillation with water. This oil is now manufactured on a large scale in Australia, and has become a prominent article of commerce. It is used in soap manufactories and also in the preparation of various perfumes. The timber is soft and easily worked, but after a time it hardens and is valued for its durability. The bark is used for tannin.

Euphorbium. (Fr. *Euphorbe*, Ger. *Euphorbium*, Sp. *Euphorbe*.)

An excessively acrid gum-resin obtained from various species of the spurge family, in northern Africa, Arabia, the East Indies, and the Canary Islands. It is of a dirty yellow

colour, and exudes from the bark of the trees when an incision is made. Its use is now chiefly confined to veterinary medicine, though it is sometimes mixed with Burgundy pitch for making plasters for affections of the joints. In its powdered state, when mixed with starch or flour, it has been used in cases of affection of the eyes and ears.

Everlasting Flower. (Fr. *Immortelles*, Ger. *Ruhrkraut*, Sp. *Yerbas.*)

The popular name of certain plants of the order *compositae*, which have the peculiar property of retaining their colour and appearance for a long period after they have been gathered. This property is owing to their dry firm structure, and the practical absence of moisture. The most common species is the *Helichrysum bracteatum*, which is largely cultivated in the south of France, in Italy, and southern Germany. A very extensive trade is now carried on by these countries in growing and preserving everlasting flowers. The principal importing countries are Great Britain and the United States.

Extract of Meat. (Fr. *Extrait de viande*, Ger. *Fleischextract*, Sp. *Extracto de carne.*)

A preparation obtained by separating all the nutritious elements from animal food and condensing the same into small bulk. It is generally obtained by the action of water upon finely chopped meat, and heating the same until one-eighth of the meat is dissolved. The liquid is then condensed and the extract is preserved in hermetically sealed vessels. There are many manufactories in South America where cattle are killed wholesale for the sake of their flesh as well as their hides. The best known makers, however, are English and German firms, and their advertisements appear in all parts of the world.

Faience. (Fr. *Faïence*, Ger. *Faience, feine Töpferware*, Sp. *Faience.*)

A name formerly given to all kinds of glazed earthenware, derived from the town of Faenza, where it was manufactured. It is a term now confined to the finer kinds of pottery.

Fan. (Fr. *Eventail*, Ger. *Fächer*, Sp. *Abanico.*)

An instrument manufactured for the purpose of creating a current of air. Large fans used in mechanical operations and for ventilating purposes are generally made of various metals in the form of blades, and the current is kept up continuously by rotation. The ordinary fan is made of any light flat expanded substance, and the current is set up by the backward and forward movements of the hand. The huge fans used in India for ventilating rooms are called punkahs. Fan-making is a very considerable industry of China, and the value of the fans annually exported exceeds £600,000. Japan also does a large trade in the same articles. Ornamental fans, made of feathers, ivory, silk, tortoiseshell and other delicate and costly materials are chiefly manufactured in Paris, this industry forming one of the special trades of the French captial.

Farina. (Fr. *Farine*, Ger. *Mehl*, Sp. *Harina.*)

The general name applied to many substances which are like flour or other starchy materials. In South America the meal of the cassara is called farina. Commercially the name is confined to the starch obtained from potatoes, and this article is prepared, for the purposes of adulteration, with arrow-root, tapioca, butter, and various other articles of food. A peculiar preparation, known as French sago, is employed in the manufacture of starch sugar, and as a thickener in calico printing. Foods specially prepared from various kinds of meal are known as farinaceous.

Feathers. (Fr. *Plumes*, Ger. *Federn*, Sp. *Plumas.*)

The plumage of birds of various kinds in which a large trade is done by many countries, and of which Great Britain annually imports a quantity valued at over £2,000,000. They are used both for upholstery work and for ornamentation. For the former the feathers and down of the eider-duck are most valued after which come those of swans, geese, ducks, and fowls. For the latter the feathers most favoured are those of the ostrich, the bird of paradise, the humming-bird, the albatross, and the penguin.

Felt. (Fr. *Feutre*, Ger. *Filz*, Sp. *Fieltro.*)

A fabric formed without either spinning or weaving. It depends for its

structure upon the natural tendency of woollen fibres and certain kinds of hair to combine with each other. The general process of manufacture is to card waste wool, moisten it with steam, and then pass it through a felting machine in which it is beaten in such a manner that a compact cloth is formed. Felt is largely used for making carpets and covers of various kinds, and in many cases a printed pattern ornaments it. A peculiar coarse felt is the material out of which the Russian peasantry make their winter garments, and especially boots and shoes, as it alone is capable of resisting the intense cold of Siberia. Gun-wads and pianoforte hammers are other uses to which felt is put. The property of felting is taken advantage of in the manufacture of felt hats for which the hair of various animals can be used. Roofing felt is coarse felt saturated with pitch, coal-tar, or asphalt, and is employed for covering roofs, vessels, and iron buildings. The manufacture is widely distributed throughout Europe and the United States.

Fennel. (Fr. *Fenouil*, Ger. *Fenchel* Sp. *Hinojo.*)

A plant of the umbelliferous order, rather like the dill, but distinguished from it by the nature of its fruit. It is very widely distributed throughout Europe and Asia. The seeds have an agreeable odour and flavour, and are used as a condiment, especially in the preparation of macaroni by the Italians. They are rich in an essential oil containing anethol, and this oil is of value in medicine as a stimulant and narcotic. The leaves of the fennel are sometimes served as a salad.

Fenugreek. (Fr. *Fenugrec*, Ger. *Griechischer Hensamen*, Sp. *Semilla de heno.*)

A genus of plants of the small class as the clover. It was used as fodder for cattle by the Greeks—hence its name. Owing to its smell it must be mixed with other plants. The seeds of the common fenugreek are largely used as a condiment in India, and in the manufacture of curry powder. An oil is extracted from them which enters into the composition of certain ointments, especially diachylon.

Feverfew. (Fr. *Pyrèthee*, Ger. *Spanische Kamille*, Sp. *Magarza.*)

A plant of the *compositae* order, somewhat resembling the chrysanthemum, and closely allied to the camomile. It is commonly found in cornfields and hedgerows. Owing to the popular belief in its properties, feverfew was long used as a remedy in cases of fever, but its employment and value are now very slight.

Fibre. (Fr. *Fibre*, Ger. *Fiber, Faser*, Sp. *Fibra, Hebra.*)

Properly the name fibre is applied to all substances which are employed to make cordage or to be woven into webs, whether animal, vegetable, or mineral. Commercially, however, the term is used only for those animal or vegetable substances which are suitable for textile manufactures. Of the animal ones the chief are silk, wool, and hair, and of the vegetable the principal are cotton, flax, jute, hemp, and esparto. Each of these is noticed under a separate heading. The leaves of certain palm trees yield fibrous materials of considerable value in such work as basket-making, and the stalk of many grasses, including wheat straw, are employed in hat and mat making.

Fig. Fr. *Figue*, Ger. *Feige*, Sp. *Higo.*)

The fruit of the *Ficus carica*, a plant belonging to the nettle order, but sometimes included in the mulberry order. It is a native of the East, but it is now successfully cultivated in many sub-tropical countries, and especially in the south of Europe. The fruit is eaten either fresh or dried, but it is in the latter state that it forms an important article of food in the countries where it grows and an extensive subject of commerce. The drying takes place either in the sun or in specially constructed ovens. Enormous quantities are annually imported by Great Britain from Mediterranean countries. The best come from Smyrna, of which there are three qualities, Eleme, Erbeli, and Aidin. They are packed in small oblong boxes, round drums, or baskets. Portugal, Greece, and Italy are next in order as to exports. A spirit is sometimes distilled from fermented figs, and ground figs are frequently mixed with coffee. A customs duty of 7s. per cwt.

is imposed on all figs imported into Great Britain.

Filberts.

(See *Hazel.*)

Fir. (Fr. *Sapin*, Ger. *Fichte, Tanne*, Sp. *Pino.*)

A comprehensive name for many species of trees belonging to the order *Coniferae.* For the most part they are lofty and hardy, and their leaves are evergreen. One of the best known is the Norway spruce, which penetrates within the Arctic circle. It yields various products, such as resin, turpentine, tar, and lampblack. The resin is called frankincense. The timber is largely exported under the name of "white deal." Another species is the Canadian fir, from which "Canada balsam" is obtained, and an extract employed in the manufacture of spruce beer. The California pine also gives excellent timber. The only pine now native in Britain is the Scotch fir, and this yields the wood known as yellow deal, and tar by distillation.

Fireclay. (Fr. *Argile réfractaire*, Ger. *Flherfest Thon*, Sp. *Tierra refractaria.*)

A variety of clay used in the manufacture of retorts, crucibles, etc., which can be heated to a very high temperature without fusing or softening. It is usually found in districts where coal is mined. It is obtained in Bergium, Germany, France, Sweden, and the United States as well as in Great Britain, the principal deposits in this country being near Newcastle-on-Tyne, Stourbridge, and Glasgow. There is a considerable export trade in Stourbridge clay. The main components of this clay are silica and alumina.

Flagstones. (Fr. *Dalles*, Ger. *Fliesen*, Sp. *Ladrillos.*)

Stones used for paving, cisterns, etc., They are generally composed of sandstones combined with argillaceous or calcareous matter, and split easily into large flat slabs. The flagstones obtained from Festiniog in North Wales are remarkable for their even grain, those of Yorkshire for their hardness, and those of Caithness for their durability.

Flannel. (Fr. *Flanelle*, Ger. *Flanell*, Sp. *Franela.*)

Woven woollen fabric, loose in texture, much used for underclothing on account of its warmth. The process of manufacture is very similar to that employed for woollen cloth. Wales early gained a great reputation for its flannel, and that made from the wool of its mountain sheep still commands the best prices. Lancashire takes the second place and Yorkshire the third place both as to the extent and the value of the flannel manufactured. The chief towns in Wales engaged in the manufacture of flannel are Newtown, Welshpool, and Llangollen, in Lancashire, Bury and Rochdale, and in Yorkshire, Leeds and Halifax. Flannel shirtings are made at Auchterarder, in Scotland. There is now a large trade done by the United States in special flannels, and France produces fine dyed varieties.

Flavine. (Fr. *Flavine*, Ger. *Flavin*, Sp. *Flavine.*)

A yellow dye-stuff, the concentrated preparation of quercitron bark, obtained from a species of oak, imported from the United States, and used for dyeing wool. Like most other dye stuffs its use has declined since the introduction of the aniline colours.

Flax. (Fr. *Lin*, Ger. *Lein, Flachs*, Sp. *Lino.*)

The fibre obtained from plants of the order *Linaceae.* The best known of the many species of the plant, as well as the most important, is the annual common flax, *linum usitatissimum.* It grows largely in Russia, Saxony, Belgium, Holland, Italy, and the north of France. In the United Kingdom its growth has declined, though there are still considerable crops raised in Ireland. For our linen manufactures, therefore, we are almost entirely dependent upon the flax imported from various continental countries, the largest supply coming from Russia.

In the preparation of flax for manufacture into cloth, or flax-dressing, as it is called, the following method is adopted. The stems of the plant are either cut or pulled up by the roots and allowed to dry. After the seeds have been removed by a process known as rippling, the flax is subjected to what is called retting. The stalks or stems are steeped in water and fermentation sets in, the result being that the fibres are freed from the woody matter, and

the gummy and glutinous matter is removed. This part of the work is now generally carried out by a special process known as Pownall's. After being removed from the vats and allowed to dry in the open air, the flax is scutched, that is, placed in a machine called a scutching machine, when the work of complete separation of the fibre from the woody matter is completed. The fibre is then ready for being made into linen. It is from the finest flax that the well-known Brussels lace is made.

The seeds of the common flax plant are used for the manufacture of linseed oil, and the crushed seeds are made into oil-cake and linseed meal. When linseed oil is mixed with boiling water carron oil is obtained, a substance often used for treating burns.

The New Zealand flax is very different from and superior to the European flax, its fibre being beautifully fine, strong, and silky. Owing to the presence of a large amount of gummy and resinous matter it is not easy to prepare it for commercial usage.

Flocks. (Fr. *Bourre*, Ger. *Flocken* Sp. *Copos, Vedijas.*)

The refuse of wool, the ends of waste feathers, the husks of old cotton, and various other substances of the same kind, used for filling cheap mattresses and cushions, There is an export trade done in them by Great Britain to the extent of about £500,000 per annum.

Floor cloths.

The name applied to various kinds of carpets, matting, and other coverings for the floors of rooms. In trade, however, a floor-cloth generally signified a strong thick canvas, oiled and painted, though it has been extended to linoleum and other substances in which cork is the chief article used. Oilcloths made of canvas are largely manufactured in Dundee and London, and the annual value of the quantity exported by Great Britain is little short of £1,000,000. Linoleum is made by processes founded upon patents taken out in 1860 and 1863. Canvas is the ground work of this kind of floor-cloth also, but the surface is created with a preparation of pulverized cork and linseed oil. Kamptulicin is made of cork and indiarubber, but it is now little used. A new kind of floor-cloth, known as cork carpet, is coming into use, and is supposed to be an improvement upon linoleum, the cork being more carefully prepared and better treated.

Flour. (Fr. *Farine*, Ger. *Mehl*, Sp. *Harina.*)

The meal of corn, especially wheat, finely ground and sifted. When exported from most countries it is ordinarily sent out in sacks, each sack containing 280 lbs., but from America flour comes in barrels containing 196 lbs. each. The United States, Canada, Germany, and Austria are the countries from which we import most of our flour.

Flowers, Artificial. (Fr. *Fleurs artificielles*, Ger. *Nachgemachte Blumen*, Sp. *Flor artificial.*)

Imitations of flowers extensively used for ornamentation and decoration. Owing to changes of fashion the industry is subject to great fluctuations. At one time the trade was almost exclusively a French one, and Paris was especially noted for the beauty of its productions. Even now France manufactures more than the rest of the world put together, and her export trade exceeds £1,000,000 per annum. The making of wax flowers, which is a completely distinct trade, is almost exclusively carried on in England.

Fluor Spar. (Fr. *Spath fluor*, Ger. *Flussspat*, Sp. *Espato fusible, Castina.*)

A mineral of very frequent occurrence in Derbyshire, and on that account often known as Derbyshire spar. It is usually found in veins with other ores in the shape of cubical crystals. It is really fluoride of calcium. This mineral is hard, brittle, and transparent. Its most common colours are green, violet blue, and yellow, but many other varieties are met with. Besides its use for ornamental purposes, such as the manufacture of vases, etc., fluor spar is a valuable flux in the reduction of metallic ores. When heated with sulphuric acid hydrofluoric acid is formed, a substance of great use in the etching on glass.

Fox. (Fr. *Renard*, Ger. *Fuchs*, Sp. *Zorra.*)

The well-know carnivorous animal, valuable in commerce, however, only on account of its fur. Of the numerous species the principal are :—

(1) Blue fox, found in N. America. Its fur is of a brownish-blue colour, or slate when at its est. Between 3,000 and 4,000 skins are imported annually by Great Britain, the price paid for a skin being sometimes as high as £10.

(2) Cross fox, in Russia. Its skin is about half as valuable as that of the blue fox.

(3) Gray fox, in the United States. This animal is very common, and the price of a skin is seldom more than five shillings.

(4) Red fox, in Siberia and N. America. Nearly 100,000 skins are exported annually, the prices being from five shillings to twenty-five shillings a skin.

(5) Silver Fox. The fur of this fox is the most valuable of all, and as much as £200 has been given for a single skin. The animal is found in Alaska, British Columbia, and the Hudson Bay Territory. The principal buyer is Russia.

(6) White fox, in N. America. Nearly 20,000 skins are annually imported by Great Britian, the prices obtained having an extremely wide range.

Frankincense. (Fr. *Encens, Oilban,* Ger. *Weihrauch,* Sp. *Incienso, Olibano.*)

A species of resin, soft, tough, and yellowish in colour, possessing an agreeable odour when burned. It is not fully ascertained what are the trees or shrubs from which the resin exudes, but they are certain species of firs and pines. The best frankincense is obtained from India, that of Arabia being much inferior in quality. It is used in the religious rites and ceremonies of many churches on account of its smell, and in medicine it is employed in the preparation of certain kinds of plasters.

Fuchsine. (Fr., Ger., and Sp., *Fuchsine.*)

One of the aniline colours. It gives all the various tints of red, magenta, etc., to silk and wool. In France this dye is much used not only in the manufacture of light tissues, but also in the making and colouring of artificial flowers.

Fucus.

The name given to various species of sea-weed, which form the principal vegetation of rocky shores between the marks of high and low tides. It is found abundantly on the northern shores of Europe, Asia, and America In extreme cases it serves as fodder for cattle, but its main use is for manuring land, its value depending upon the presence of a large proportion of ash. It is also employed in the preparation of iodine.

Fuller's Earth. (Fr. *Terre à foulon,* Ger. *Walkererde,* Sp. *Arcilla de Cimolis.*)

A soft, greasy, earthy clay, deriving its name from the fact that it is much used by the fuller in cleaning woollen cloth from grease. It is an hydrous bisilicate of alumina with a slight admixture of various impurities, such as oxide of iron, lime, magnesia, and soda. In colour it is generally brown or of a slate-blue colour, though greenish varieties are not unknown. On the application of heat fuller's earth melts, and unlike clay, it falls to powder in water with a hissing sound, and does not form a plastic mass. Fuller's earth is found is many localities in England, but the greatest quantities are obtained from Nutfield, near Reigate, in Surrey, and from the neighbourhood of Bath. The annual consumption is nearly 10,000 tons.

Fulminates. (Fr *Fulminates,* Ger. *Knallpulver,* Sp. *Pólvora fulminante.*)

The name of explosive compounds of which there are many varieties. They are formed by the action of alcohol on the nitrate of a metal in the presence of free nitric acid. The principal fulminates are those of mercury and silver. The former is prepared by heating mercury with alcohol and nitric acid. After purification it is obtained in white crystals, which are soluble in water. The crystals are safe to handle when moist, but when dry they explode violently if struck by a hard substance or if brought into contact with a light. When mixed with sulphur and nitre, fulminate of mercury is largely used in the manufacture of percussion caps. Fulminate of silver is obtained in the same manner, silver being substituted for mercury. It forms small white needles which have a bitter taste and poisonous properties. Great care is required in its manufacture as it explodes more easily than fulminate of mercury. Its employment is almost entirely confined to making crackers and detonating toys.

Furs. (Fr. *Fourrure*, Ger. *Pelze*, Sp. *Piels.*)

The short, fine, soft hair of certain animals, growing thick upon the skin, and distinguished from hair, the longer and stiffer material. The term is applied, however, to all skins which are covered with hair. As fur is one of the most perfect non-conductors of heat, it has been used by mankind as the warmest kind of clothing. The furs of the large kinds are chiefly obtained from Siberia and North America, and of the smaller from various parts of Europe. The principal animals which are fur-producing are noticed under separate headings.

Fusel Oil. (Fr. *Alcool amylique*, Ger. *Amyl-alkohol, Fuselöl*, Sp. *Aguardiente malo.*)

Also known as Potato Spirit. The name fusel oil is given to the less volatile products separated during the distillation of various alcoholic liquors. It consists chiefly of amylic alcohol—chemical symbol C_5H_2O—but it sometimes contains propylics butylic, and hexylic alcohols, as well as several fatty acids, the principal of which is capric acid. It is a colourles, liquid possessing a strong odour and a burning taste. It is often used in the adulteration of whiskey, the milky appearance of the spirit when mixed with three or four times its quantity of water being directly ascribable to its presence. Its effect upon the human system is particularly bad. Fusel oil is also employed in the manufacture of essential oils and of certain varnishes.

Fusible Metal. (Fr. *Métal fusible*, Ger. *Schmelzbares metall*, Sp. *Metal fusible.*)

An alloy composed of the three metals bismuth, lead, and tin, with the addition in some cases of a small amount of cadmium. This alloy is known as fusible metal on account of the fact that it melts at a temperature below that of boiling water. As it expands upon solidifying, the metal is useful in stereotyping, and in taking casts of medals, etc. It was formerly much used in making safety plugs for steam boilers, as the metal melted when the pressure became too great. It was discovered, however, that a change took place if there was a long exposure to heat, and that the metal could not be relied upon in all cases.

Fustian. (Fr., *Futaine*, Ger. *Barchent*, Sp. *Fustan.*)

A thick fabric made of twilled cotton, but including moleskin, velveteen, corduroy, and various other varieties. Manchester is the great centre of the industry. The substance is chiefly used for making up into male apparel.

Fustic. (Fr. *Bois jaune, fustic*, Ger. *Gelbholz, Fustikholz*, Sp. *Fustete.*)

The wood of a tree known as *Morus tinctoria*, which flourishes in India and in certain parts of tropical America. A yellow colour is obtained from it which is used in dyeing wool. Fustic has held its own against the aniline colours longer than any other vegetable dye. There is another fustic, known as the Zante or young fustic, found in southern Europe, which also gives a yellow dye, but this is more fugitive than the former. The twigs and leaves of the Zante fustic are useful in tanning.

Galam Butter.

The name of a fatty substance obtained by boiling the roots of a species of *Bassia*, a native of the East Indies. It is of lard-like consistence, with a taste resembling that of cocoa. Medicinally it is used as a lubricant in cases of rheumatism, and in the manufacture of lip salve. The seeds of the Bassia yield an oil which is employed for illuminating purposes and for making soap.

Galangal. (Fr. *Galanga*, Ger. *Galgant*, Sp. *Galanga.*)

The *Alpinia galanga*, a tree of the ginger order. The rhizome forms the bulk of the preserved ginger exported from China. The root of the lesser galangal, *Alpinia officinarium*, which is met with in European commerce, has a pungent odour and taste, resembling those of the grains of paradise. China does a large trade in galangal, mainly with India.

Galbanum. (Fr. *Galbanum*, Ger. *Galbanum, Mutterharz*, Sp. *Galbano.*)

A gum resin of a disagreeable odour and sharp taste obtained from the Persian *Ferula galbaniflua*. In its medicinal properties it is very similar to assafoetida, though not so powerful. When taken internally it is supposed to

alleviate rheumatic pains; externally it is applied as a plaster in cases of indolent swellings. There is very little commerce in this article.

Galena. (Fr. *Galène*, Ger. *Schwefelblei, Bleiglanz*, Sp. *Galena.*)

Also called Lead Glance. This mineral is massive sulphide of lead, consisting of 86·6 parts of lead and 13·4 parts of sulphur. It is heavy and opaque, has a grayish colour, possesses metallic lustre, and occurs crystallized in veins in granites, sandstones, limestones, etc. Sometimes other metals are combined with it, as zinc, silver, copper, iron, and antimony. Almost all the lead of commerce is obtained from galena. It is abundantly distributed not only in Great Britain, but also in most of the European countries and in the United States.

Gallic Acid. (Fr. *Acide gallique*, Ger. *Gallustäure*, Sp. *Acido agallico.*)

An acid occurring in small quantities in gall-nuts, sumach, divi-divi, and other plants. It is generally prepared however, from gall-nuts alone. For this purpose the nuts are immersed in water for some weeks until fermentation sets in. The action will take place more quickly if sulphuric acid is added to the water. When pure it forms slender colourless crystals with a silky lustre, and a sour taste. The presence of salts, particularly iron salts, produces a dark blue colour, which finally becomes black on exposure to the air. Commercially it is used in the manufacture of inks. Medicinally it acts as an astringent, and owing to its peculiar properties it has been found very efficacious in cases of Bright's disease. Its chemical symbol is $HC_7H_5O_5H_2O$.

Galls. (Fr. *Galles*, Ger *Galläpfel*, Sp. *Agalla.*)

Also known as Gall nuts and Oak apples. They are the abnormal excrescences formed upon the leaves and stalks of certain trees, especially species of oak trees, by gall insects which introduce their eggs and leave the larvae to develop. The best galls are obtained from Aleppo. They are useful by reason of the presence of large quantities of gallic and tannic acids, substances of value in the manufacture of ink and in tanning. Large imports are made by Great Britain from Greece, Italy, and Algiers, beside Asiatic Turkey.

Galvanised Iron. (Fr. *Fer galvanisé*, Ger. *Galvaniscertes eisen*, Sp. *Hielo galvanico.*)

Iron coated with zinc to prevent its rusting by the oxidizing action of air and water. There is no galvanic process in the matter. The iron is cleaned as perfectly as possible and then dipped into molten zinc, when a thin layer of the zinc adheres to the iron. Galvanized iron was first used for cooking vessels, but afterwards became very common for roofing purposes, and making buckets, telegraph wire, bolts for ships, etc. It is also used for water pipes, but it is unsuitable for steam pipes as when exposed to steam the galvanized iron rapidly decomposes and holes make their appearance. A vessel made of this substance must not be used for acids. When galvanized iron is wrinkled it is termed corrugated iron.

Gambier. (Fr., Ger., and Sp., *Gambier.*)

An extract obtained from the leaves of the shrubs *Uncaria gambir* and *Uncaria acida*, which grow extensively in the East Indies. The leaves are boiled in water, and the liquid obtained evaporated until a thick glue-like substance remains, which is afterwards allowed to dry in the form of cakes previous to being exported. Gambier is of a brownish colour. Medicinally it is sometimes used as an astringent, but it is chiefly valuable in tanning and dyeing. It is exported almost exclusively from Singapore.

Gamboge. (Fr. *Gommegutte*, Ger *Gummigutti*, Sp. *Gomaguta, Gutagamba.*)

An acrid, yellowish gum resin, the product of various trees which grow in the East Indies. The best gamboge comes from Siam, and is obtained from the *Garcinia morella.* When the bark of the tree is cut the resin comes out as a thick yellow juice, but hardens rapidly when exposed to the atmosphere. When exported it is generally in the form of a pipe or roll, or in cylindrical masses. Medicinally it is used in conjunction with various drugs, as its purgative properties are extremely violent. In the arts it is

employed in water-colour painting, in staining wood, and in coating brass-work.

Garancine. (Fr. *Garancine*, Ger. *Garancin*, Sp. *Garancine.*)

A dye stuff prepared from the madder root by treating it with sulphuric or hydrochloric acid. The madder is boiled in acidulated water for several hours, after which it is washed with pure water and then dried, pressed, and ground into a powder. The powder is the garancine of commerce, It was at one time very largely used in calico-printing, but the introduction of aniline dyes has affected this as well as other dye-stuffs.

Garnet. (Fr. *Grenat*, Ger. *Granat-stein*, Sp. *Granate.*)

The name rather of a group of minerals which crystallize in peculiar forms, the most common being the dodecahedron, than of any one particular stone. Garnets are of various colours, though brownish red is the most ordinary, the stone being then composed of a silicate of iron and aluminium. They have, in general, a resinous lustre. The garnet of commerce is obtained from Bohemia, Ceylon, Brazil, and Pegu, the best coming from the last mentioned place.

Gasolene. (Fr. *Gasoline*, Ger. *Gasolin*, Sp. *Gasoline.*)

A highly volatile distillate obtained from rectified petroleum. It is used for gas-engines and horseless carriages.

Gauze. (Fr. *Gaze*, Ger. *Gaze*, Sp. *Gasa.*)

A thin, delicate, transparent texture woven of very fine fibre. Its name is said to have been derived from Gaza, in Palestine, where it was first made. Originally, it was a silken fabric, and large quantities are now produced by France and Switzerland. It is the result of a peculiar kind of weaving, the object being to keep the threads as far apart as possible. Gauze is used for dress purposes and also by millers for flour sifting. At one time the industry was very considerable in the west of Scotland, but few traces now remain. Owing to the development of the cotton trade cheap textiles of the nature of gauze have become exceedingly common.

Gelatine. (Fr. *Gélatine*, Ger. *Gelatine*, Sp. *Gelatina.*)

The name applied commercially to the product obtained from various animal tissues, and used for human food or in the arts according to its source and method of preparation. Gelatine proper is chiefly obtained from the softer parts of the hides and skins of oxen, calves, and sheep. Various processes have been devised for its extraction, and these have now attained a high state of perfection. The purest forms only are used for food, in the manufacture of confectionery, and medicinally for coating pills of nauseous taste. Other forms of gelatine have many and varied uses, especially in photography and in the manufacture of glue.

Gentian. (Fr. *Gentiane*, Ger. *Enzian*, Sp. *Genciana.*)

A plant of the order *Gentianaceae*, of which there are over one hundred species. The best known is the *gentiana lutea*, which is gathered in many parts of the mountainous districts of southern Europe. The active bitter principle is obtained from the dried root of the plant. It is an excellent bitter and stomachic, and is much used in cases of general debility of the digestive organs and where a general tonic for the system is required.

Geranium Oil. (Fr. *Huile de géranium*, Ger. *Geraninmöl*, Sp. *Oleo de geranio.*)

The name of several kinds of essential oil which enter into commerce on account of their rose-like odour, and which are consequently used as a cheap substitute for oil of roses. The true oil is obtained from the *Pelargonium radula* by distillation of the leaves and flowers with water. Practically the whole of this substance is obtained from Algiers.

German Silver. (Fr. *Argent blanc*, Ger. *Nickelmetall*, Sp. *Plata blanca de Alemania.*)

This metal is sometimes called nickel silver. It is a hard, silvery white compound, being an alloy of copper, nickel, and zinc. The three are mixed in various proportions. Two qualities are used for casting. In the first, equal portions of nickel and zinc are combined and the same weight of copper is added. This alloy, however, is very difficult to work. The second quality is composed of copper, nickel, and zinc

in the following proportions: 62·5, 12·5 and 25. For rolling the proportions are: 57·1, 23·9 and 19. The metal is remarkable for its hardness and wear-resisting power. It has entirely superseded copper as the foundation of electro-plated goods, and its use has become more common since it has been discovered that it can be spun as well as Britannia metal. Formerly it could only be stamped or hammered. Many articles are made from German silver without any coating of silver, such as spoons, forks, etc. Since the metal is easily attacked by acids, scrupulous cleanliness is necessary in the use of such articles. Various other substances have lately come into use which are closely allied to German silver, such as silveroid, argentoid, navoline, and nickeline. The change is produced by the introduction of other metals such as tin, cadmium, etc. It has lately been asserted that a process of plating aluminium has been discovered. If this is true the manufacture of German silver may rapidly decline.

Ghee. (Fr., Ger., and Sp., *Ghee.*)

Or Ghi. A species of fluid butter made from the milk of the buffalo. It is very largely used in Asia, as much as 300,000 tons being annually consumed in Indian alone, but is little known in Europe, and is not much relished by those Europeans who are acquainted with it. The milk is boiled for some time before the butter is formed, and then cooled and churned. Curdled milk and salt are afterwards added before the substance is packed in jars. It is employed by the Hindoos not only in cooking, but also in the making of sweetmeats.

Gherkins.

(See *Cucumber.*)

Gin. (Fr. *Genièvre*, Ger. *Genever*, Sp. *Nebrina de Holanda.*)

A distilled spirit prepared from malt or from raw grain, and then flavoured with juniper berries. The name is derived from the French name for juniper, *genièvre.* The manufacture of the best gin is peculiarly a Dutch industry, the principal town engaged being Schiedam. Hence the names Schiedam and Hollands. It is exported in peculiarly shaped bottles, and the principal customers of the Dutch are Great Britain and the United States. Pure gin has considerable medicinal value owing to the presence of the essential oil of juniper. There is a large business done in the manufacture of gin in England, especially in London, but the spirit is vastly inferior to the Dutch. It is almost always adulterated, and a fictitious strength is given to the spirit by the addition of oil of turpentine, common salt, potato spirit, and sulphuric acid; in fact, there is more adulteration in the case of gin than in that of any other spirit.

Ginger. (Fr. *Gingembre*, Ger. *Ingwer, Ingber*, Sp. *Gengibre.*)

The well-known spice, the product of the herbaceous tropical plant *Zingiber officinale.* The chief supplies of ginger are obtained from the West Indies and Africa, though a certain amount comes from the Far East. The best of all is imported from Jamaica. In commerce two principal kinds are met with, black ginger, which is obtained from the roots of the plant by peeling and drying in the sun, and white ginger which is prepared by scalding the roots and afterwards drying them in an oven. In addition to starch and gum, the ginger root contains an essential oil to which are ascribed its peculiar flavour and pungency. Preserved ginger, which consists of the roots of the plant preserved in syrup, is largely imported from the East Indies and China. There are many preparations in general use. Essence and syrup of ginger are used for flavouring, ginger beer and ginger wine depend upon it for their qualities, and ginger and other spices enter into the composition of gingerbread. Ginger grass oil is a volatile oil obtained from the leaves of the *Andropogon schaenanthus.* In Egypt it is known as Idris oil, and it is largely used for the purpose of adulterating otto of roses. A customs duty of 3s. per cent. is imposed on preserved ginger.

Gingham. (Fr. *Guingan*, Ger. *Gingang*, Sp. *Guingan.*)

A cotton fabric used for making dresses which was originally manufactured in India, but afterwards introduced into Europe. It is either of light or of medium weight. It differs from calico in this respect, that its colours are not produced by printing

the cloth, but by dyeing the yarn of which it is made. It is now essentially a British manufacture, Manchester and Glasgow being the principal centres. There are various other materials of a somewhat similar kind in the market, the chief of which are known as zephyrs and chambreys.

Ginseng. (Fr., Ger., and Sp., *Ginseng.*)

The root of the *Panax schinsing* or *Aralia ginseng.* The Hindoos, Chinese, and Japanese attribute most extraordinary medicinal properties to this root; it is, in fact, a kind of powerful tonic and universal panacea—a sort of elixir of life. The root is prepared for use by being dried over a charcoal fire, and afterwards steamed in an earthenware vessel provided with holes. Though its odour is not disagreeable, its taste is somewhat bitter. The largest trade in ginseng is done between Korea and China, but there are considerable imports of a species of the plant into China from the United States.

Girasol. (Fr. *Girasol*, Ger. *Katzenauge*, Sp. *Girasol.*)

A precious stone remarkable for its beautiful reflections of red and yellow under the influence of a strong light. It is a variety of quartz or rock crystal, having the appearance of the opal or the calcedony. The finest specimens have been found in Brazil and Mexico, but good varieties are also obtained in Hungary and Siberia. Imitations of girasol are made by adding a small quantity of oxide of tin to glass.

Girder. (Fr. *Traverse*, Ger. *Balken*, Sp. *Cuarton.*)

A beam supported at both ends and used for the purpose of carrying loads placed between the points of support. They are made of cast or wrought iron and steel. For buildings cast iron is found to be most suitable, wrought iron being mainly employed in the construction of bridges. There are now many combinations of girders used by engineers. Britain suffers severely in the making of girders through foreign competition, especially that of Belgium.

Glass. (Fr. *Verre*, Ger. *Glas*, Sp. *Vidrio.*)

The mineral product, generally transparent, formed by the fusion of certain silicious and alkaline matters, the mixture varying according to the requirements of the substance. The principal kinds of glass are the following:—(1) Flint glass, sometimes called crystal or crystal glass, composed of potash, silica, and oxide of lead; (2) Window glass, including crown, sheet, and plate, composed of soda, silica, and lime; (3) Bohemian glass, composed of potash, silica, and lime; and (4) bottle glass, or common glass, composed of soda, silica, and lime, with small quantities of potash, soda, iron, manganese, and baryta. It is to the presence of iron that the green colour of the last is owing, and in the manufacture of all the best kinds the greatest care must be taken to have all the materials absolutely free from iron, or the green colour must be neutralized by adding oxide of manganese. The materials required for the manufacture of glass are first carefully mixed, and then strongly heated in special pots and furnaces, expressly made for the purpose. The after processes depend upon many circumstances, and can only be detailed in works specially dealing with the subject. Glass is largely made in England, especially at St. Helen's, in Lancashire, but there is a considerable import as well as export trade in this substance. The best sand for glass-making is obtained from France and Belgium.

Glauber's Salt. (Fr. *Sel de Glauber, Sulfate de soude*, Ger. *Schwefelsaures Natrium*, Sp. *Sal de Glauber.*)

Sulphate of soda, formed of compact, white, massive crystals, which effervesce rapidly. Its chemical composition is represented by the symbol $N_2SO_4 10H_2O$, but on exposure to the air the crystals lose all their water and are resolved into a white powder. The powder has a bitter and saltish taste, and it enters into the constitution of several mineral waters, such as those at Carlsbad and Cheltenham. It is also found in certain lakes in the United States. Glauber's salt is prepared from common salt and sulphuric acid, for the purpose of being used in the manufacture of carbonate of soda. For medical purposes a purer preparation is required, and carbonate of lime must be added. It is employed medicinally in cases of fever and inflammation.

Gloves. (Fr. *Gants*, Ger. *Handschuhe*, Sp. *Guantes.*)

Gloves are either woven and knitted, and made of cotton, silk, or wool, or cut out from leather and afterwards stitched. The first is a part of the hosiery trade. In England, Derby and Nottingham have a large trade in cotton gloves, whilst Leicester sends out great quantities of woollen gloves. On the Continent of Europe Berlin and various towns in Saxony are the chief centres of the thread and cloth glove trade. In the manufacture of leather gloves, the skins of deer, sheep, lambs, goats, and kids are used, the skins being first of all tanned. For particular kinds of gloves other skins are often used, especially when great wear-resisting power is necessary. For military gloves chamois leather is found most suitable, whilst the celebrated English dog-skin gloves are made from the skins of the Cape sheep. Kid gloves are generally made of sheep leather, and the different kinds of these, glacé and suède, depend upon the manner in which the leather is finished and dressed. France has long been renowned for the finish of its gloves. The best of the kid are made at Paris and Grenoble, whilst Vendôme is celebrated for its military gloves. Bel gium and Denmark both export largely, Copenhagen having a very considerable trade. In England the cheif seats of the manufacture of leather gloves are Worcester, Yeovil, Ludlow, and London. The English dog-skin gloves, mentioned above, are without a rival in the market.

Glucose. (Fr., Ger., and Sp., *Glucose.*)

The name of a variety of substances prepared from animal or vegetable products, but closely resembling each other in their properties. The ordinary glucose, also called dextrose or grape-sugar, occurs in the juices of ripe fruits, but it is generally obtained as a saccharine product from maize, potatoes, or other starchy substance by the action of sulphuric acid. It is imported into the United Kingdom in liquid and solid form from Germany, France, and the United States, especially for the use of brewers. There is a customs duty imposed of 3s. 3d. per cwt. on solid, and 2s. 6d. per cwt. on liquid glucose.

Glue. (Fr. *Colle*, Ger. *Leim*, Sp. *Cola.*)

An impure gelatinous substance obtained from a large number of animal products, and useful for its adhesive properties. Though known under various names there are three principal kinds of glue—skin, or leather glue, bone glue, and fish glue. The first is prepared from the refuse of tan yards. This refuse is first treated with quicklime and water, then exposed to the air and dried, and afterwards boiled. The gelatinous part of the whole dissolves out, the water evaporates, and the glue remains like a jelly. Much care is required in the drying process, or the substance is quite valueless. Many thousands of tons are made and used annually in the United Kingdom, the best being manufactured in Scotland; in fact, Scotch glue is accounted the best in the world. Bone glue is made in France and Germany, and is obtained as a by-product in the manufacture of bone charcoal.

Marine glue is a substance used by shipbuilders for cementing purposes, though containing no gelatine at all. Ordinary glue would be dissolved by the action of water. A substitute is found in marine glue which is india-rubber dissolved in naphtha with the addition of a certain quantity of powdered shellac.

Glycerine. (Fr. *Glycérine*, Ger. *Glyzerin*, Sp. *Glicerina.*)

A colourless, syrupy liquid with a pure sweet taste. It belongs to the series of alcohols, and is a compound of carbon, hydrogen, and oxygen. Its chemical symbol is $C_3H_5(OH_3)$. Its specific gravity is 1·26. Glycerine exists in combination with fatty acids in animal and vegetable fats, and in certain fixed oils. It is most easily prepared by heating fats in a current of super-heated steam, and this is found as a by-product in soap and candle works. On a small scale glycerine can be prepared from olive oil treated with oxide of lead and mixed with water. The uses to which this substance is put are enormous. It acts as a preservative and an antiseptic, as a cosmetic and an emollient, in the manufacture of soap and perfumery, as a substitute for cod-liver oil, and in the preparation of nitro-glycerine, dynamite, and other

explosives. It is further employed if calico-printing, in the preparation on leather, and for the purposes of improving the quality of wine and of imparting keeping power to beer.

Goats. (Fr. *Chèvres*, Ger. *Ziegen*, Sp. *Cabras, Chivas.*)

Animals found in many parts of the world, and reared on account of their flesh, their skin, and their hair. In Europe the largest numbers are reared in Spain, and the fewest in England where the species is not considered of great value. The Angora and other Eastern goats are best known and are most highly prized. The skins of goats are tanned and employed in the manufacture of gloves and various kinds of leather. The United Kingdom imports the products of the goat from all parts of the world, the skins coming mainly from N. Africa and India.

Gold. (Fr. *Or*, Ger. *Reines Gold*, Sp. *Oro.*)

The beautiful yellow precious metal, which is largely imported as ore, bullion, and coin, and which is employed for coinage, ornaments, plate, and jewellery. It was formerly obtained in small quantities in various parts of Europe, in South America, and in India, but for the last half century Australia and California have supplied the demands of the world, and the valley of the Yukon, in Alaska, promises to be a very plentiful field in the immediate future. Gold is always found mixed with other minerals and takes the form of grains or nuggets. As the former it is found in alluvial deposits derived from crystalline rocks. In order to separate it, the sand or gravel is carefully washed in running water, the lighter gravel is washed away and the heavier gravel and the gold left behind. In California and Australia the metal is found interspersed through quartz. The rock is crushed by machinery, and treated with mercury or fused with lead by which means the pure gold is separated. With the exception of platinum and iridium gold is the heaviest metal in general use, its specific gravity being 19·3. It is the most malleable and ductile of metals; it can be beaten into leaves so fine that light can be transmitted through them, and drawn out into wire so fine that 15 grains will give a length of more than 2,000 yards. It is too soft to be worked alone, and when in use it is found necessary to have an alloy of copper or silver. Pure gold is said to be of the fineness of 24 carats. For the gold coinage of Great Britain an alloy of 22 parts gold and 2 parts copper is used, and this is said to be 22 carat gold. In jewellery there are various standards, the most usual being 18, 15, and 9 carats. The metal is not attacked by any ordinary acid—sulphuric, hydrochloric, or nitric—but it dissolves readily in aqua regia, a mixture of the two last mentioned acids. As it does not combine with oxygen there is no tarnishing by exposure to the atmosphere, and this is one of the reasons why gold is so highly prized. It is an excellent conductor of heat and electricity, and only melts at an exceedingly high temperature. Of its compounds the most important is chloride of gold, used for toning photographs. This last mentioned substance is obtained by dissolving gold in aqua regia and evaporating a portion of the acid.

Gold-beaters Skin. (Fr. *Baudruche*, Ger. *Goldschlägerhaut*, Sp. *Película.*)

The thin but tough membrane prepared from the outer coat of the great intestine of the ox. It is obtained by immersing the intestine in a weak solution of potash, scraping it with a knife, beating, soaking in water, and stretching. Each strip is then treated by peculiar processes with alum water, isinglass, and the white of eggs. The membrane is afterwards cut into squares. These squares are placed by gold beaters between the leaves of beaten gold. Another application of the skin is the dressing of slight wounds. The trade in this substance is very limited.

Gold Leaf. (Fr. *Or en feuille*, Ger. *Goldlahn*, Sp. *Lámina de oro.*)

The thin leaf of gold, pure or alloyed, obtained by hammering. The best gold leaf is made from 23 carat gold. The metal is cast into a thin ingot, and rolled out into a leaf until its thickness is $\frac{1}{280}$ of an inch. After being softened this is carefully divided into pieces an inch square. As many as 150 of these squares, with as many pieces of vellum or tough paper 4 inches square, are

piled so as to form a " cutch," and are beaten until the gold is as large as the paper or vellum. Further cuttings into pieces an inch square are made, and the leaves are placed between gold beaters' skin, and again hammered. This process is continued until the thickness is reduced to $\frac{1}{282,000}$ of an inch. The finished leaves are trimmed and generally made up into books of 25 leaves. They are employed for gilding.

Gold-beating was mainly carried on in Florence in the middle ages. France, Belgium, and Germany entered largely into competition during the last half of the 19th century, and the last mentioned country now makes a large quantity of inferior gold leaf. England imports much gold leaf from France, but the gold beater's art is carried on in most of the large towns of the United Kingdom, London being the chief centre.

Gold Plate.

(See *Plate.*)

Gooseberry. (Fr. *Groseille à maquereau*, Ger. *Stachelbeere*, Sp. *Uva espina, Grosella.*)

The fruit of the *Ribes grossularia*, a prickly shrub with small, greenish flowers. The fruit is well-known, and is sold in enormous quantities in the northern parts of Europe and America. In the south of Europe it is very little known. There are many varieties, and the cultivation is rapidly extending. The best gooseberries in England are produced in Lancashire. Besides its wholesomeness and pleasantness as a fruit, and its employment in making preserves, the gooseberry is used for the manufacture of certain wines, especially a spurious champagne, and vinegar.

Gourd. (Fr. *Gourde*, Ger. *Kürbiss*, Sp. *Calabaza.*)

A genus of plants of the order *Cucurbita*, found in many parts of Europe, Asia, and North America. In the tropics the fruit attains a great size, and is used as a food, both for mankind and for cattle. In English gardens there are various species of gourd to be found, especially the common pumpkin and the vegetable marrow. The fruit of one kind of gourd, known as the bottle gourd, has a hard outer covering which is used as a vessel for holding fluid. The fruit of another kind, the torrel gourd, contains a fibre which is sometimes used as wadding for guns.

Grains of Paradise. (Fr. *Graines de paradis*, Ger. *Paradies-körner*, Sp. *Grano de paraiso.*)

Otherwise known as Malaguetta pepper. The name given to the seeds of the *Amomum Grana Paradisi*, a plant of the Ginger order, which grows in Madagascar, Ceylon, and Guinea. The imports into Britain, which amount to a few tons a year, are from the last named place. By the natives these seeds are used as a spice and a condiment, but in Europe their legitimate employment is confined to veterinary medicines. Pungency is given to both fermented and spirituous liquors by the addition of these seeds, and so serious did the evil of adulteration become a century ago that an Act of Parliament (56 Geo. III. c. 58) was passed prohibiting, under a heavy penalty, brewers and beer dealers having grains of paradise in their possession. The drug obtained from the seeds is a favourite adulterating agent of gin.

Gram.

Or Chick-pea. The name given in India to various kinds of pulse belonging to the order *Leguminosae*. It is somewhat extensively cultivated in the south of Europe and in India for the sake of its seeds, which are eaten by the natives of the latter country. Between 10,000 and 15,000 tons are annually exported from India for horse and cattle food. Oxalic acid can be extracted from the leaves and stems of some of the plants.

Granite. (Fr. *Granit*, Ger. *Granit*, Sp. *Granito.*)

The well-known and easily recognised rock, of igneous origin, composed of felspar, mica, and quartz in varying proportions, though felpsar is the main ingredient, seldom forming less than one half of the whole. The felspar is of a pinkish colour and occurs in crystals of varied sizes, the mica, which is of a yellowish tint, occurs in thin plates irregularly distributed throughout the rock, while the quartz is in glassy masses. The texture and colour of granites naturally differ according to the colour and proportion of their

constituents. The principal colours are red, grey, and white. Granite usually occurs in great bosses or amorphous masses, and often forms the heart of the great primitive mountain chains. The most durable kind is used in the making of bridges, in great engineering works, and also in the building of public halls. Owing to the fact that it is much more difficult to cut and to work than ordinary building stone it is an expensive substance to use, but its great durability more than counterbalances the extra expenditure. The best British granites are the grey Aberdeen and the red Peterhead. The latter is much admired when polished and is especially used for columns in public buildings and for ornamental grave stones. On the continent, Sweden, Italy, Switzerland supply most of the granite required, and the rock is extensively worked for home use in the United States and Canada.

Grape.

(See *Vine.*)

Grape Sugar. (See *Sugar.*)

Graphite.

(See *Black Lead.*)

Grass Cloth.

The fine soft fabric woven in China, and made from the fibre of a species of nettle—the *Boehmeria nivea.* The plant is often wrongly called China grass. It is estimated that nearly 2,000 cwt. of this material are annually exported from China.

Grass Oil. (Fr. *Huile d'herbe*, Ger. *Grasöl*, Sp. *Oleo de Yerba.*)

The name applied to a certain number of volatile oils, derived from different plants. That obtained from the leaves of the *Andropogon warancusa* is useful in cases of rheumatism, and is sometimes used as a stimulant, its effect being similar to that of cajeput oil. Ginger-grass oil and Geranium oil have already been noticed under separate headings. Lemon grass-oil, also known as Citronella oil, is obtained from the same plant at Ginger-grass oil. Its odour resembles that of citron, and it is used for scenting soap. Cyperus-grass oil, the product of the *Cyperus esculentus*, is employed as a table oil as well as in the manufacture of soap. The last mentioned plant is grown widely in southern Europe.

Grease. (Fr. *Graisse*, Ger. *Fett*, Sp. *Gordura, Grasa.*)

The general name for any kind of unctuous refuse, more especially animal fat. It has, however, been frequently confined to those fatty matters which possess a certain amount of solidity, and which are deteriorated by impurities to such an extent that they cannot be used for such purposes as candle-making. Grease is extensively used as a lubricant, and is in great demand for certain processes, such as currying leather. Currier's grease is a mixture of tallow and cod oil. That used for the axles of wagons and carts is made of tallow, palm-oil, common soda, and water. Sometimes a little tar is added, and the proportions of the ingredients differ in summer and winter.

Greasy Wool. (Fr. *Laine graisseuse*, Ger. *Fett Wolle*, Sp. *Lana grasa.*)

The wool or fleece of sheep when shorn and still unscoured. A great portion of the wool which comes from Australia and the Cape is in this condition, and greasy.

Greengage. (Fr. *Prune de Reine Claude*, Ger. *Die Reine-Claude*, Sp. *Reine-Claude.*)

A cultivated variety of the common plum, its round fruit being green in colour. By the French it is esteemed as one of the finest varieties in cultivation, and known by them under the name of "Reine Claude." Large quantities are grown in England, but there is a considerable import trade, from France particularly.

Greenheart. (Fr. *Laurier*, Ger. *Lorbeerbaum*, Sp. *Laurel.*)

A large tree of the laurel order, a native of Guiana. The name greenheart is derived from the colour of the wood. The timber itself is of considerable value, being very hard and durable, and heavier than water. It is much used for shipbuilding and for turning. It is also employed in large engineering works where great strength is required. The bark supplies a medicine of which is used in cases of fever and is known as bebeeru.

Grindstones. (Fr. *Meules, Pierre à aiguiser*, Ger. *Mühlstein, Schleifstein*, Sp. *Piedra amoladera.*)

Cylindrical shaped sharp sandstone or gritstone employed for grinding and giving an edge to cutlery, tools, etc.

In the trade they are commonly known as " foots." They are secured to an axle and turned by means of steam power. There is great variation in their diameter, thickness, solidity, and texture. The best natural stones are obtained in Staffordshire. Artificial stones, made by combining grains of sand with silicate of lime, are now largely superseding natural stones.

Groats. (Fr. *Gruau d'avoine*, Ger. *Hafergrütze*, Sp. *Harina de avena mondada.*)

Oats which have been shelled and deprived of their husks. When ground they are known as Embden groats.

Ground Nuts. (Fr. *Noix de terre*, Ger. *Erdnüsse, Erdeicheln*, Sp. *Castañas de tierra.*)

The product of the *Arachis hypogea*, a plant belonging to the order *Leguminosae*. The plant is a native of Africa, though it is cultivated in the West Indies and in India. It is remarkable from the fact that the pods of nuts are first formed in the air, and are afterwards forced into the ground as they increase in size and there ripen. Ground nuts are valuable as a food in the regions where they abound, and enter largely into commerce on account of the oil which they contain. They are imported into France in large numbers, mostly from the west coast of Africa to Marseilles. The fixed sweet oil obtained resembles olive oil and is often used as a substitute for it. On the Continent the oil is sometimes used for culinary purposes, in this country only as a lubricant.

Gruyère. (Fr., Ger., and Sp., *Gruyere.*)

The name of a famous cheese manufactured at the town of the same name and in the whole canton of Freiburg, in Switzerland.

Guaiacum. (Fr. *Résine gaïac*, Ger. *Guajakharz*, Sp. *Guaico.*)

The resinous product of a West Indian tree, *Guaiacum officinale*, which flows spontaneously from the stem. It is of a greenish colour, has an agreeable odour, and possesses a sweetish taste. Medicinally it is used in the preparation of various powders, pills, and tinctures—its best known use being in the compounding of Plummer's Pills. Its action is stimulating, and the resin has been advantageously employed in cases of rheumatism. The wood of the guaiacum tree is remarkable for the direction of its fibres, its hardness, and its durability. It is used in the manufacture of ships' blocks, rulers, pestles, bowls, etc.

Guano. (Fr., Ger., and Sp., *Guano.*)

The accumulated dry excrement of animals, especially of sea-fowl, found in enormous quantities in many of the islands of the Pacific and off the coast of Bolivia. The preservation of the excrement is largely due to the fact that the districts in which it is found are practically rainless, and the guano has remained dry. Being rich in phosphates and nitrogenous compounds, guano is a most important manure. Its use was almost unknown until 1840. After that date the imports into Great Britain were enormous, and the decline in the trade is only due to the fact that the supplies are becoming exhausted. Besides the guano deposits above mentioned, there are extensive deposits of bats' guano in Texas, Arkansas, and the Bahama islands. Fish guano, now largely obtained from Norway and much in request as a manure, is the dried refuse of fish ground to a powder. Artificial manures are now rapidly displacing the natural ones.

Guava. (Fr. *Guave*, Ger. *Gujava*, Sp. *Guava.*)

The pulpy many-seeded fruit of a species of *Psidium*, a tree belonging to the Myrtle family. There are many varieties of the plant, the best known being the large yellow guava of the West Indies and Brazil, which is now grown somewhat extensively also in the East Indies. The fruit has an aromatic taste and it is used in the preparation of various confections, the principal being guava jelly and guava cheese. The wood of the guava tree is hard and strong, and is much valued by turners.

Guiana Bark. (Fr. *Écorce de Guiane*, Ger. *Guianarinde*, Sp. *Corteza de Guiana.*)

The bark of a species of cinchona tree, extensively grown in French Guiana, the only country from which the bark is exported. This bark is medicinally valuable as a powerful febrifuge. It is the chief component of the well-known Warburg's Fever Drops.

Gum. (Fr. *Gomme*, Ger. *Gummi*, Sp. *Goma.*)

The general trade name for various exudations from plants and trees growing in the tropics. Many of the so-called gums are, in fact, resins. The principal gums are noticed under separate headings. They differ widely in their characters and properties, but generally speaking gums may be divided into three classes, those containing arabin, those containing bassorin, and gum-resins. The chief imports are obtained from the West Coast of Africa and from India. In recent times many substitutes for gums have been manufactured on a large scale from various kinds of starch, the starch being first converted into dextrine. These are extensively used for dressing calicoes and other fabrics, and for gumming paper.

Gun Cotton. (Fr. *Coton à canon*, Ger. *Schiessbaumwolle*, Sp. *Algodon explosivo.*)

The powerful explosive used in mining and other operations when a great rending or shattering effect is desired. For many years after its discovery the manufacture and storage of this substance were attended with great danger, but the method of manufacture is now perfectly safe and gun-cotton may be stored without fear. In England the substance is generally obtained in the following manner. Cotton waste, thoroughly freed from grease by boiling with alkalies, is carefully picked, and the fibre separated by passing the waste through what is called a teasing machine. It is then dried, cut into specified lengths, and prepared for dipping into a mixture of sulphuric and nitric acids, the mixture consisting of three parts of the former and two of the latter. Any excess of acid is washed off, and the residue is reduced to a pulp, pressed hydraulically to one-third of its bulk, and moulded into various shapes and sizes for storing. Among the great advantages possessed by gun-cotton over gunpowder are the absence of smoke in combustion, the rapidity of action, and the fact that it is unimpaired by moisture. It is for the last-named reason that it is used in submarine mining and for charging torpedoes. The best method of exploding gun cotton is by detonation. The chemical symbol of this substance is $C_6H_7O_2 3(NO_3)$.

Gunjah. (Fr., Ger., and Sp., *Gunjah.*)

A narcotic drug akin to bhang and haschisch, obtained from the flowering tops of the Indian hemp plant. This substance, when the resin called guaza has not been removed from it, is extensively smoked in India, and its consumption, does not diminish even with the increased excise duty imposed by the Indian Government. The cultivation is almost entirely confined to a small tract in Bengal, called Rajshahye, and the amount produced is about 1,000,000 lbs. per annum.

Gunny Bags. (Fr. *Sacs de teille*, Ger. *Bastsäcke*, Sp. *Sacas de corteza.*)

Sacks woven from the coarse fibre of the jute plant. The name gunny is also applied to the coarse strong sacking manufactured from the same fibre. The bags and the sacking are largely exported from India, especially Bengal, to the United States, Australia, the Straits Settlements, and other countries. The trade is scarcely twenty-five years old, but so enormous has become the demand that twenty steam factories are now engaged in the manufacture in India. The gunny bags are mainly used for wool packs, and as sacks for grain, seed, and salt. Bags and cloth of a similar kind are now being made in Dundee.

Gunpowder. (Fr. *Poudre à canon*, Ger. *Schiesspulver*, Sp. *Pólvora.*)

The well-known explosive used for firearms, blasting, and in the manufacture of fireworks. It is a mechanical mixture of nitre, charcoal, and sulphur. The ingredients are mixed in different proportions in different countries, but in England the three are in the ratio of 75, 15, 10. When the gunpowder is required for sporting purposes the ratios are 77, 14, and 9. The nitre and the charcoal form the explosive mixture, and the sulphur is only added for the purpose of aiding the combination at a lower temperature. When blasting powder is made the nitre is less in quantity and the charcoal more. It is most essential that the nitre, charcoal, and sulphur should be carefully freed from all impurities if a satisfactory powder is to be obtained. The nitre is imported

mainly from India, the sulphur from Sicily, and the charcoal is mostly obtained from Holland and Germany, the wood used in its preparation being dogwood, alder, or willow. The three are separately ground to a fine powder and sifted; the whole is then mixed in a revolving drum, water is added, a paste formed, the paste is ground and blended, a cake is formed, and this is afterwards granulated by various processes, according to requirements. When ready for use it is stored in barrels containing not more than 100 lbs. each. There is little external trade in gunpowder, each country making its own. Great Britain, however, does a certain export trade, mainly to the Colonies.

Gurjun Balsam. (Fr. *Baume de copahu d'Inde*, Ger. *Gurjun Balsam*, Sp. *Balsamo de India.*)

Also called Wood Oil. This is an oleo-resinous substance which resembles copaiba in its appearance and medicinal properties. It is procured from various trees in Bengal by incisions and heating the trees with fire. In the East gurjun has been much used in skin diseases, and latterly it has found favour in England for cases of eczema and lupus. In tropical Asia it is also used as a varnish for boots, and for resisting the attacks of ants upon timber.

Gutta-percha. (Fr. and Ger., *Gutta percha*, Sp. *Gutaperca.*)

A substance resembling indiarubber in many respects, and often confounded with it in the public mind. The great difference between the two consists in the fact that gutta percha is non-elastic, while indiarubber is elastic. Gutta-percha is the exudation of many species of trees, though the principal one is the *Isonandra Gutta*, which grows extensively in Sumatra, Borneo, and other East Indian Islands, and whence the whole supply of gutta percha is obtained. The milky juice which comes from the tree hardens very quickly on exposure to the air. It is then of a brownish-red colour, though this is owing mainly to the presence of various impurities, for purified gutta-percha is of a greyish-white colour. At ordinary temperatures it is hard and tough as wood, but as the temperature rises it becomes softer and can be spread out into cakes. Before being used in manufactures it is purified and kneaded by powerful machinery with the aid of hot water and bleaching powder. It is a hydrocarbon and soluble in benzine and bisulphide of carbon. Its uses are exceedingly numerous. Being a non-conductor of electricity it is extensively employed as a covering for telegraph wires and for other insulating processes. Unfortunately it is not a very lasting substance, and a substitute of greater stability is being sought for. It is used for belting for machinery, pump-buckets, tubing, golf balls, and as a cheap substitute for leather in the making and mending of boots. On account of its plasticity it is useful for taking impressions of seals, medals, coins, and moulds generally. When dissolved in bisulphide of carbon it forms a useful cement.

The amount of the imports and the price of gutta-percha vary enormously, and difficulty is occasioned by the wasteful cutting of the trees by the natives.

Gypsum. (Fr. *Gypse.* Ger. *Gips*, *Gyps*, Sp. *Yeso.*)

A widely distributed and abundant mineral, usually white, but often with a yellowish or brownish tint. It is composed of sulphate of lime and water. The marble-like variety is called alabaster, the transparent and crystallized selenite, and the fibrous satin spar. Gypsum is used for ornamental purposes, though its liability to be scratched, on account of its softness, has not made its employment very extensive. When crushed, gypsum is used as a manure, especially in North America. When it is burned and rendered anhydrous and afterwards ground to powder, plaster of Paris is obtained. This powder, when mixed with an equal bulk of water, sets immediately into a fine white solid.

Haberdashery. (Fr. *Mercerie*, Ger. *Kurzwaren*, Sp. *Quincalla.*)

The general trade name for threads, tapes, fringes, trimmings, and small wares of the same nature. The haberdashery trade is generally combined with the woollen drapery trade, and in the export returns it is classed with millinery, embroidery, and needlework.

Haddock. (Fr. *Cabilland*, Ger. *Schellfisch*, Sp. *Merluza.*)

The small fish, *Gadus aeglefinus*, of the same genus as the cod-fish, which enters largely into commerce, both in its fresh and dried state. It is almost entirely confined to the coasts of Britain, and when dried and smoked is exported, especially to the countries of S. Europe, in large quantities.

Hæmatite. (Fr. *Hématite*, Ger. *Bluteisenstein*, Sp. *Hematite.*)

One of the principal ores of iron. It is so called on account of the blood-red colour of one variety, a sesquioxide of iron, which occurs in large kidney-shaped masses in different parts of Great Britain, but especially in North Lancashire and Cumberland. Red haematite is also found in many parts of Europe and North America. In France there is another variety known as brown haematite, which is of great importance. Haematite is generally very free from impurities, such as sulphur and phosphorus, and is valuable in the preparation of the purest form of iron. Its value has risen considerably since the introduction of the Bessemer process for manufacturing steel.

Hair. (Fr. *Cheveux*, *Poils*, Ger. *Haar*, Sp. *Cabello.*)

Besides the hair of various animals used in the manufacture of implements and for the purposes of stuffing, etc., human hair is an article of commerce of no inconsiderable dimensions. The supplies of Great Britain are obtained chiefly from France, Germany, India, and China. That imported from France is dark in colour, whilst that which comes from Germany is light. It is used for making up into wigs. The hair imported from Asia is of a coarser description and this is worked up into watch guards, brooches, bracelets, etc. It is impossible to obtain anything like an accurate estimate of the trade done in human hair alone.

Hake. (Fr. *Merluche*, Ger. *Stockfisch*, Sp. *Pejepalo.*)

A genus of fish of the cod family found in the seas off the English and North American coasts. It is an important article of food and commerce, both in its fresh and in its dried state. It is dried in the same manner as cod and ling. The exports from England are to southern Europe.

Halibut. (Fr. *Halibut*, Ger.. *Heilbutte*, Sp. *Hipogloso.*)

A large flat fish, and somewhat like the turbot. It is common in the northern seas, though it is rarely found in latitudes lower than the English Channel. It is much prized in Greenland, and is not only used as an article of food, but as the source of a valuable oil. When dried it is sent, like so much other dried fish, to the countries of southern Europe.

Ham. (Fr. *Jambon*, Ger. *Schinken*, Sp. *Jamon.*)

The cured hind legs of pigs, though the name is not infrequently applied to the preserved flesh of other animals, especially to mutton and beef. In the preparation of ham, the general process followed is to rub the meat with a mixture of salt and saltpetre, and to steep it for some weeks in brine. It is afterwards drained and hung up to dry in a cool place. If the ham is hung over a fire made of non-resinous wood the flavour of the meat is improved and it is said to be smoked. Beef ham is similarly prepared, though spices are sometimes added to the brine. Mutton ham is cured in the same way as pork ham, but requires less time in the process. The best hams are obtained from Belfast and Westphalia. There is a great amount of curing done in Great Britain, especially in Wiltshire, but there are enormous imports from the United States to supply the demands of this country. Chicago is the chief centre of the pork trade.

Hardware. (Fr. *Quincaille*, *Quincaillerie*, Ger. *Eisenstahl*, *Metallwaren*, Sp. *Cuchilleria gruesa*, *Quinquilleria.*)

The general trade name for all kinds of articles manufactured from iron, steel, copper, brass, etc., especially ironmongery, cutlery, and implements. In England the chief centres of manufacture are Birmingham, Sheffield, and Wolverhampton. The hardware trade of Germany and the United States competes very severely with that of England.

Hare. (Fr. *Lièvre*, Ger. *Hase*, Sp. *Liebre.*)

The well-known rodent, valuable on account of its flesh and its fur. There are several varieties of the animal to

be found in North America, and it is from the United States and Canada that large supplies of skins are annually obtained.

Harmonium. (Fr., Ger., and Sp., *Harmonium.*)

A keyed musical instrument, generally of a compass of five octaves, in which the sounds are produced by a current of air passing through vibrating reeds, the air being supplied from bellows worked by the feet of the performer. The French excel in the manufacture of this instrument, though large numbers are made every year in England. The numerous improvements of late years have brought the harmonium into greater favour, and the fact that it is not affected in tune by a damp atmosphere has made it an instrument of value in those climates where a piano cannot be kept.

Hartshorn. (Fr. *Corne de cerf*, Ger. *Hirschhorn*, Sp. *Cuerna de ciervo.*)

The filings of the antlers of the red deer. The products derived on distillation are known as oil of hartshorn, salt of hartshorn, spirits of hartshorn, etc. Spirits of hartshorn is a name still commonly applied to designate a solution of ammonia.

Hat. (Fr. *Chapeau*, Ger. *Hut*, Sp. *Sombrero.*)

The covering of the head, made of innumerable varieties of material when intended for women, and of straw, cloth, felt, or silk when intended for men. In the felt-hat trade the fur of rabbits and beavers is mostly used, but the commonest felt hats are made of sheep's wool. For the finest felt hats camels' hair is the article in demand. Ingenious mechanical contrivances have come into use for carrying out felting operations. In the manufacture of silk hats the body is first prepared and covered with a kind of varnish, and the silk plush afterwards added. There are extensive exports of hats from Great Britain, particularly of straw and felt. The felt-hat trade is principally carried on in the small towns around Manchester.

Hay. (Fr. *Foin*, Ger. *Heu*, Sp. *Heno.*)

Dried grass, often mixed with clover and other allied plants, used as fodder for horses and cattle. In England meadow grass is that used for the preparation of hay. In order to obtain hay in perfection the grass must be cut at a time when it contains the greatest quantity of nutritive matter, and dried in such a manner as to retain it. The weather, naturally, is a most important factor to be considered. After being stacked, hay is generally cut into bundles or trusses of 56 lbs. each, a load of hay consisting of 36 trusses. Great Britain imports a vast quantity from the continent, particularly from Holland.

Hazel Nuts. (Fr. *Noisettes*, Ger. *Haselnüsse, Lambertsnüsse*, Sp. *Avellanas.*)

The edible fruit of the *Corylus avellana*, a small tree grown in Britain and in the temperate parts of Europe, Asia, and America. Different species are known as filberts and cob-nuts. The Spanish or Barcelona nuts are another species of hazel nuts, and a still further variety is found in and exported from Turkey. Imports into Britain are obtained chiefly from Terragona, the quantity being about 400,000 bushels per annum. An oil is extracted from the nuts which is used by painters on account of its drying properties, and by perfumers in the manufacture of fragrant oils. From the bark of the hazel tree another oil is obtained which is sometimes used medicinally as a vermifuge.

Hellebore. (Fr. *Ellébore*, Ger. *Nieswurz*, Sp. *Eléboro.*)

The name of two distinct plants, *veratrum album* and *veratrum viride*, the roots of which are sometimes used in medicine on account of their powerful effects in cases of mania, epilepsy, and dropsy. These roots are imported into England from Marseilles and Hamburg.

Hematite. (See *Haematite.*)

Hemp. (Fr. *Chanvre*, Ger. *Hanf*, Sp. *Cañamo.*)

The name applied to various vegetable substances cultivated on account of their fibre, but principally to the *cannabis sativa*, a native of central Asia, though now widely distributed over Asia, Europe, and Africa. The hemp fibre is obtained from the bark after long steeping in water. Hemp, dressed and undressed, is a most important article of commerce, and there are very large exports to various parts

of the world from Russia, Germany, and Italy. The finest hemp is produced by the last mentioned country. It is specially employed for the weaving of cloth and the manufacture of thread, rope, and cordage. In India hemp is grown not so much on account of its fibre, but for the narcotic obtained from a resinous secretion. From hemp seed an illuminating oil can be extracted by pressure. The oil is used by the Russian peasantry. It is also employed in the manufacture of paints, varnishes, and some kinds of soft soap. The residue obtained after extraction of the oil is compressed the into an oil-cake for the feeding of cattle, while the grain itself is a food for birds.

Henbane. (Fr. *Jusquiame*, Ger. *Bilsenkraut*, Sp. *Beleño.*)

A plant belonging to the same order as the potato, tobacco, deadly nightshade, etc. It grows spontaneously in Great Britain in waste places, and also in many parts of Europe. Though containing a poisonous alkaloid of great power, henbane can often be usefully employed medicinally, both externally and internally, the dry leaves being the valuable part of the plant. As a narcotic it has peculiar advantages over laudanum and opium. It forms a good substitute for belladonna.

Henna. (Fr., Ger., and Sp., *Henna*).

The leaves of a small shrub cultivated in N. Africa and S. Asia, sometimes known as Egyptian privet or Jamaica mignonette. From the leaves a colouring matter is obtained which, when dried, powdered, and made into a paste with water and catechu, is used throughout the East to stain the nails and tips of the fingers. It is also employed to dye skins and leather a reddish-yellow colour. There are considerable exports from Persia and Egypt, especially to Turkey, and in Germany powdered henna leaves are used for dyeing furs and various kinds of leather.

Herring. (Fr. *Hareng*, Ger. *Häring*, Sp. *Arenque.*)

The well known fish, *clupea harangus*, caught in great shoals for food. The fishery is largely carried on off the coasts of Great Britain, Norway, and Newfoundland. The shoals visit the east coast of Britain in June, appearing first at Wick, and they gradually move southwards, reaching Kent before the end of the year. As a food, herrings are eaten either fresh or salted and cured. The home consumption cannot be estimated, but the export trade is gradually increasing, the best customers of England being Russia and Germany. Grimsby and Yarmouth are the important centres of the herring fishery in England, while Stornoway, Wick, Fraserburgh, Peterhead, and Aberdeen are the principal Scotch towns engaged.

Hides. (Fr. *Peaux, Cuirs*, Ger. *Häute, Felle*, Sp. *Piels, Cueros.*)

The skins of large animals. They enter into commerce either as market hides, delivered direct from slaughter houses, or salted and dried hides imported from pastoral countries abroad in bundles or bales. They are divided into four grades—heavy, light extra, seconds, thirds. The slaughter houses of Great Britain supply about 3,000,000 hides per annum, but the numbers imported are much greater. Russia, Holland, Belgium, and Italy are the principal European exporters, but most cow hides are obtained from South America and Australasia. Buffalo hides are imported into this country from India, horse hides from the River Plate, and a few heavy thick skins from Africa. They are used almost exclusively for the manufacture of leather and leather goods.

Hock. (Fr. *Hock, Vin du Rhin*, Ger. *Hochheimer*, Sp. *Hock.*)

A light German wine, either still or sparkling, the name generally applied to those wines which come from the Rhine provinces. Hock is a contraction of Hochheim, a town in the province of Hessen Nassau, the centre of the manufacture of Rhine wines.

Honey. (Fr. *Miel*, Ger. *Honig*, Sp. *Miel.*)

The thick saccharine liquid substance secreted by bees, and deposited by them in the combs of their hives. The two principal kinds are yellow and white, though there are great differences in the taste owing to the locality in which the bees are reared, the age of the hives, and other circumstances. Honey consists mainly of glucose, cane-sugar, gummy matter, and essential odorous oils, together with minute

quantities of various mineral matters. Little attention is paid to the rearing of bees in England, though it is not an inconsiderable industry in Ireland, and the honey of Scotland is celebrated. The most celebrated continental honey comes from Narbonne and Chamounix, and the greatest quantity is imported from America, especially from California. The honey is extracted by straining the comb in a very gentle heat. Honey is used in the preparation of the fermented liquor mead.

Hoofs. (Fr. *Ongles*, Ger. *Hufe*, Sp. *Uñas.*)

The horny protection of the feet of many domestic animals, which are imported for the manufacture of combs and buttons. In the Board of Trade returns they are included under the head of horns, and the value of the annual imports can only be roughly estimated at from £5,000 to £10,000. Hoofs are also employed in the manufacture of prussiate of potash and of artificial manures.

Hop. (Fr. *Houblon*, Ger. *Hopfen*, Sp. *Lúpluo.*)

The hop is a plant with twining stems, of luxuriant growth and abundant foliage. To botanists it is known as the *humulus lupulus*, and is allied to the hemp and the nettle. It is cultivated on account of its catkins or strobiles which, when powdered, contain a substance called *lupuline*, of a golden yellow colour. The catkins are extensively used for brewing, the *lupuline* giving the bitter flavour to the beer. In brewing, 1lb. of hops is added to one bushel of malt. Medicinally hops are employed on account of their narcotic properties. Hop-growing is now carried on chiefly in Kent, Sussex, Worcester, and Hereford in England, but the English crop falls far short of what is required. The deficiency is made up by imports from America and various countries of Europe, some for use and the rest for exportation, principally to British colonies.

Horns. (Fr. *Cornes*, Ger. *Hörner*, Sp. *Cuernos.*)

The hard pointed excrescences growing on the heads of various animals, especially oxen, sheep, and goats. The antlers of the various kinds of deer are not horns. Besides the horns obtained in this country Great Britain imports over 5,000 tons per annum, valued at more than £150,000. The largest supply is obtained from India, South America and the Cape being next in order. Horn is employed, according to its size, in the manufacture of a vast number of articles, ornamental and otherwise, cups, carvers, knife-handles, and umbrella handles being amongst the most common.

Hornbeam. (Fr. *Charme, Charmille*, Ger. *Hornbaum*, Sp. *Ojaranzo.*)

The *carpinus betulus*, a tree quite common in Europe, and valued on account of its wood, which is white, compact, hard, and tough. The wood is much used for making the cogs of mill-wheels, and in the manufacture of agricultural implements. When burned it produces good charcoal.

Horse Hair. (Fr. *Crin de cheval*, Ger. *Rosshaar*, Sp. *Crin de caballo.*)

About 25,000 cwts. of horse hair are imported annually, the fifth of the whole coming from Russia. The hair combed from the tails of horses is the most valuable, that obtained from the manes being much inferior in quality. Horsehair is first sorted, and then washed in warm soapy water to which lime and potash have been added. If necessary the hair is then dyed. Short hair is used for stuffing couches, mattresses, etc., and long hair is employed in the manufacture of hair seating, sacking, gloves, brushes, etc.

Horse Radish. (Fr. *Raifort, Rave sauvage*, Ger. *Meerrettig*, Sp. *Rabano.*)

The root of the *Cochlearia armoracea*, a plant cultivated in Britain and in many other parts of Europe, and which is exported from Germany in considerable quantities. This root is highly stimulating, owing its virtues to the presence of a volatile oil similar to that of mustard, an oil which contains about 30 per cent. of sulphur. It is most frequently used when scraped as a condiment with roast-beef. Medicinally it is valuable as being the most powerful antiscorbutic known. Another tree, a native of India, called the Horse Radish Tree, produces seeds called ben-nuts from which oil of ben, used by watchmakers, is extracted.

Horses. (Fr. *Chevaux*, Ger. *Pferde*, Sp. *Caballos.*)

A large export and import trade is done by the United Kingdom in live animals, about 25,000 being annually imported and 20,000 exported under normal conditions. The largest number of animals comes from Germany. The hides, grease, and hair of horses are commercial articles of vast importance, and more than 150,000 hides are received annually, principally for the manufacture of leather. The greater portion come from South America.

Hosiery. (Fr. *Bonneterie*, Ger. *Stumpfwaren*, Sp. *Medias.*)

The name originally applied to stockings, but now extended so as to comprise under garments generally, made either of cotton, wool, or silk. The centres of manufacture in England are Nottingham, and Leicester, and in Scotland, Hawick. Hosiery is one of the most important exports of Great Britain.

Huckaback. (Fr. *Toile ouvrée*, Ger. *Drell*, Sp. *Arpillera.*)

A coarse hemp fabric, sometimes figured like damask. It is commonly used for the manufacture of tablecloths and towels.

Hydrochloric Acid. (Fr. *Acide chlorhydrique*, Ger. *Chlorwasser-stoffsäure, Salzsäure*, Sp. *Ácido muriático.*)

One of the most important compounds in inorganic chemistry. Its chemical symbol is HCl. Under ordinary conditions it is a gas, and is easily prepared from common salt by the action of sulphuric acid, the other product of the reaction being sulphate of soda. It is very soluble in water, and the aqueous solution has been long known in the arts as spirits of salt or muriatic acid, and is sold as such. Its uses are very extensive in dyeing, calico-printing, bleaching, etc. Medicinally, hydrochloric acid in a very dilute form acts as an antiseptic and a tonic, and is sometimes used in cases of throat affection.

Hydrocyanic Acid. (Fr. *Acide hydrocyanique, Acide prussique*, Ger. *Cyanwasser-stoffsäure*, Sp. *Ácido prúsico.*)

Otherwise prussic acid, a compound of carbon, hydrogen, and nitrogen. Its chemical symbol is HCN. It is prepared by passing sulphuretted hydrogen over dry cyanide of mercury. This is a most deadly and violent poison, and remarkably rapid in its action. Medicinally it is used in a very diluted form as an ingredient of lotions to diminish itching in skin diseases, and internally, it is taken in small quantities to relieve pains of the stomach, vomiting, and functional palpitation of the heart. It acts powerfully upon the nervous system, any excessive quantity paralyzing the whole.

Hydrogen Peroxide. (Fr. *Hydrogène péroxyde, Eau oxygéné*, Ger. *Wasserstoff-Peroxyd*, Sp. *Agua oxidulada.*)

A thick, transparent, colourless liquid, whose chemical symbol is H_2O_2. It has no smell, but possesses a bitter taste. It bleaches the majority of vegetable colours, and is much used for the hair. In dilute solution it is much employed for the restoration of oil paintings.

Hyssop. (Fr. *Hyssope*, Ger. *Isop*, Sp. *Hisopo.*)

A plant of the order *Labiatae*, of which there are but few species. Common hyssop, *Hyssopus officinalis*, is a native of southern Europe, especially of the Alps and Austria, but it now grows extensively in the East. It has an agreeable aromatic odour. The leaves and the young shoots of the plant are sometimes used as a seasoning for culinary purposes. In a dried state they act as a carminative and a stomachic. The medicinal qualities are due to the presence of a volatile oil. Syrup made from hyssop is recommended for colds.

Ice. (Fr. *Glace*, Ger. *Eis*, Sp. *Hielo.*)

An enormous quantity of ice is now produced artificially by freezing machines and freezing mixtures. These are of various kinds, but in the main, the manufacture of ice is carried on through the abstraction of heat from water, by the vaporization of liquid ammonia or ether. But in addition there is a large amount of natural ice imported annually into Great Britain. In the middle of the last century the Wenham Lake Ice Company did the largest trade in the world in this substance. Now almost the whole of the supply for Great Britain is derived from Drobak, a small

town near Christiania, in Norway. Naturally the trade varies enormously owing to the difference of the seasons.

Iceland Moss. (Fr. *Mousse d'Islande*, Ger. *Isländisches Moos*, Sp. *Musgo de Islande.*)

A leafy lichen, the *cetraria islandica*, found in northern latitudes generally, and valued for its nutritive and medicinal qualities. It contains about 80 per cent. of farinaceous food. Naturally it has a bitterness of taste. but this bitterness is removed by steeping in water. It forms an excellent food for invalids, and medicinally it is used in cases of lung disease.

Iceland Spar. (Fr. *Spath d'Islande*, Ger. *Isländischer Spat*, Sp. *Esparavan.*)

A glassy mineral, otherwise known as calcite or cale-spar. Its chemical symbol is $CaCO_3$. It is frequently found associated with metallic ores, and often in connection with limestone and other rocks. It has the peculiar phenomenon of double refraction, and is therefore used in the construction of polarizing instruments.

Ignatius Beans.

The seeds of the *Ignatia amara*, a tree closely allied to the *nux vomica*, and a native of the Philippine Islands. They contain a large quantity of strychnia, and at one time were considered a specific against cholera.

Immortelles.

(See *Everlasting Flowers.*)

Indian Corn.

(See *Maize.*)

Indian Ink.

(See *Ink.*)

India-rubber.

(See *Caoutchouc.*)

Indigo. (Fr. *Indigo*, Ger. *Indigo*, Sp. *Añil, Indigo.*)

The important dark-blue dye-stuff is obtained from many species of plants which grow in the tropics and at the Cape. The chief source, however, of commercial indigo is the *Indigofera tinctoria*, a plant of Bengal, where the best indigo is prepared, and whence it is shipped. Other kinds of the substance, differing greatly in quality, appearance, and value, are obtained from Java, Central America, and West Africa. Indigo is the result of the fermentation to which the indigo plants are subjected. Fresh leaves are thrown into tanks and covered with water. After about twelve hours fermentation is set up, and the liquid is drawn off as soon as sufficient colour has been extracted. This liquid is then subjected to a process called beating or splashing, and the result is a change of colour from yellow to dark brown. It is afterwards allowed to rest, and the precipitate, in the form of a powder, is taken away, and pressed into blocks. It owes its value as a dyeing agent to the presence of indigotin, the chemical symbol of which is $C_8 H_5 NO$. Indigo is the best substance for dyeing woollen cloth and for calico printing. Latterly artificial indigo has been obtained from a coal tar product, and Germany now supplies her own wants from this source. It is doubtful whether Bengal growers will be able to compete for any length of time with the artificial manufacturers.

Ink. (Fr. *Encre*, Ger. *Tinte*, Sp. *Tinta.*)

The substance used for writing and printing, the former kind being fluid and the latter thick or viscous. There are many methods of manufacturing writing inks, but the best black consists of a solution of ferrous sulphate, or copperas, added to an infusion of gall nuts together with a small quantity of gum. For inferior inks shumac takes the place of gall nuts. To prevent mouldiness setting in creosote or carbolic acid may be employed in addition to the above. A very good black ink may also be obtained from an infusion of logwood to which a little chrome alum and gum arabic has been added. Coloured inks are obtained by the addition of vegetable dyes or aniline solutions. In the manufacture of copying ink, sugar and gum or glycerine are mixed with ordinary ink. This addition prevents the ink drying and allows an impression to be made. Printer's ink is a greasy or oily compound, the commonest kind being a mixture of oils made from paraffin and resin and ordinary lampblack. For the better sort lampblack, or other mineral colouring matter, is mixed with special oils or varnishes, and the compound varies according to the rapidity with which the printing work has to be executed. The manufacture of coloured printer's ink is a difficult

and complicated matter. Marking ink consists of a solution of nitrate of silver, gum, carbonate of soda, and ammonia. By the combined action of heat and light the silver is reduced to a metallic state and deposited in the fibre of the cloth, producing a firmly fixed black mark.

Iodine. (Fr. *Iode*, Ger. *Iod*, Sp. *Iodine.*)

One of the chemical non-metallic elements which is very widely distributed over the world in combination with other substances. It was at one time largely prepared from kelp or seaweed ash, but more recently it has been obtained from the salines of France and England, and in South America it is prepared from the iodate of sodium, a substance which is associated with nitrate of sodium in native Chili saltpetre. At ordinary temperatures iodine occurs in solid dark scales, though it sometimes crystallizes in rhombic octahedra. In its purest state it is black, and has a specific gravity of 4·9. Its odour is peculiar, and its taste is bitter. Iodine is extensively used in photography, and some of its compounds are most important in medicine, iodine of potassium having a prominent position in the pharmacopœia.

Ipecacuanha. (Fr. *Ipécacuana*, Ger. *Ipecacuanha, Brechwurzel*, Sp. *Ipecacuana.*)

The valuable medicine derived from the creeping herbaceous plant *Cephaelis Ipecacuanha*, a member of the Peruvian bark family. It is a native of Brazil, and the dried root is exported from Rio Janeiro, Buenos Ayres, and other South American ports. Recently the cultivation of the plant has been introduced into India and Ceylon. It is simply the root that is valuable, and in its bark exists the active principle *emetine*, which renders ipecacuanha of service in medicine. The colour of the root is generally brown or red. The cases in which ipecacuanha is used are mainly dysentery, asthma, and coughs.

Iridium. (Fr., Ger., and Sp., *Iridium.*)

A rare and expensive metal, found native in the Ural Mountains, and also combined with osmium. It is very hard, white, and brittle, and is not acted upon by any acid, though as an alloy it dissolves in aqua regia. On account of its hardness iridium is used for pen nibs, for the wearing points of scientific instruments, and for contact points in telegraphy.

Irish Moss.

(*See Carrageen.*)

Iron. (Fr. *Fer*, Ger. *Eisen*, Sp. *Hierro.*)

The most important of all minerals. There is hardly a region of any extent on the face of the earth where it does not occur in one form or another, and there are some regions which yield it in vast quantities. Iron occurs native almost exclusively in meteorites, where it is usually associated with nickel, and in certain volcanic rocks, such as the basalts of Greenland, in which it is scattered about in grains and nodules. The iron of commerce is obtained exclusively from ores of the metal ; and, in by far the greater quantity, from the oxides of iron. The world's annual production of the mineral amounts to nearly 60 million tons, two-thirds of which is produced in about equal quantities by the United Kingdom, the United States, and Germany. France comes next in order. The most important ore of iron is the red oxide, known as hematite, which occurs in a variety of forms. It has a brownish-black, reddish, or black colour, hence its name, which means blood-stone. Its hardness is such that it can just be scratched by the blade of a knife, but, on the firmer polished forms, no cut is possible. Its specific gravity is slightly over five. Some of the blacker forms of hematite possess an exceedingly high polish, reflecting light, as if from a mirror or speculum, hence the name specular iron. In other specimens the lustrous parts are exceedingly minute and scaly, and barely distinguishable from the mineral mica, or micaceous iron. One of the early forms of hematite is the pigment red ochre.

Considerably less important than hematite, but yet very important in itself, is the yellow oxide of iron, or limonite. In some of its forms it has much the appearance of hematite, but it can generally be distinguished by its brown colour, yellow streak, and yellow powder. It is largely a bog

deposit, hence the name bog iron ore, and it is frequently even used as an ore for manufacturing purposes, in a crumbly earthy condition. Brown and yellow ochre pigments are manufactured from limonite.

A third oxide of iron is magnetite, which, as the name suggests, has the quality of being attracted by a magnet. One variety, known as lodestone, is a true magnet in itself. This important ore or iron occurs in large, one might almost say, mountain masses. A frequent, but less serviceable form, is that of octahedral crystals of both large and small size, dispersed through other rocks. A mineral much resembling magnetite, but with much feebler magnetic qualities, and having both zinc and manganese in its composition, in addition to iron, is franklinite.

The ore known as spathic iron is obtained from the carbonate of that metal, forming the mineral siderite. It occurs in yellowish-brown rhombohedral crystals, having a specific gravity of less than four. Yellow and green chrome pigments are obtained from chromite, or chromic iron.

One of the most familiar of all iron ores, but of no service for the extraction of the metal itself, is the sulphur ore, or iron pyrites. The beautiful and highly lustrous crystals of this mineral are likely to occur in almost any kind of rock. The crystals are cubes or modifications of the cube, of a brass-yellow colour, and usually so hard as completely to resist the impression of a knife. This fact should readily distinguish it from gold, with which it is frequently confounded by over-zealous searchers after the precious metal. Its greater hardness and lighter colour also serve to distinguish it from copper pyrites, another form of which is known as fool's gold. Almost the only service to which pyrites are put to-day in the arts is the making of sulphur and sulphuric acid. Another sulphur ore of iron is known as pyrrhotite or magnetic pyrites. Its reddish or bronze colour readily serves to distinguish it from ordinary pyrites, and its frequent association with nickel makes it one of the most valuable ores of that metal.

Iron is obtained from its ores by smelting with coal or coke in blast furnaces. The exact process followed depends to a large extent upon the nature of the ore. The various kinds of iron are named cast-iron, steel, and wrought iron, depending upon the amount of carbon contained in it.

When pure, iron is white. It is a most tenacious metal and very difficult of fusion. Its specific gravity is 7·8. It is strongly magnetic, but some of its magnetism is lost when the metal is heated. Though iron does not oxidize at ordinary temperatures, it is quickly covered with a black coat when heated to redness, and rust is produced when dampness is present.

The uses to which iron is put in various manufactures are too numerous to mention. It is of the utmost importance in chemistry, and gives rise to two series of salts, known as the ferrous and the ferric. In medicine it is valuable, being used as a tonic in various combinations. It is very frequently prescribed in cases of anæmia and general debility. Iron also enters into many natural mineral waters, and these are frequently prescribed when a patient is unable to take iron in its ordinary medicinal form.

Iron Wood (Fr. *Bois de fer*, Ger. *Eisenholz*, Sp. *Madera de Indias muy dura.*)

The name given to the timber of various trees, on account of its hardness and weight. The timber in almost every case is exceedingly close grained, and sinks in water. The trees from which the timber is obtained are almost entirely Asiatic or African One, the *Metrosideros vera*, belonging to the myrtle order, is found in the East Indies and is much prized in China and Japan. The wood of the *Vepris undulata*, which grows in South Africa, is known as white ironwood It is largely used for axles, ploughs, and other agricultural implements. Other ironwoods of South Africa, used both for agricultural implements and for furniture, are the timber of the *Olea laurifolia* and of the *Oba capensis*.

Isinglass. (Fr. *Colle de poisson*, Ger. *Hausenblase in Blättern*, Sp. *Cola de pescado.*)

A variety of gelatine, prepared from the air bags or sounds of certain fishes.

Originally the sturgeon alone was the source from which isinglass was obtained, and the whole trade in the substance was practically in the hands of Russia, and mainly carried on through Astrakan. The demands of commerce, however, have led to the discovery that good isinglass can be obtained from fish other than the sturgeon, and an inferior sort is even derived from cod-sounds. Brazil does a considerable trade in the substance, Maranham being the exporting town. Other supplies are obtained from the United States, Canada, and the East Indies. It appears in various forms and shapes, most frequently as a cake, and is largely employed in the manufacture of glues, plasters, diamond cement, jellies, and confectionery, in refining wines and liquors, and in giving a gloss to silk ribbons.

Istle. (Fr., Ger., and Sp., *Istle.*)

The fibre obtained from the *Bromelia sylvestris*, a tree of Mexico, and valuable for brush making. It is commonly known as Mexican grass, and is remarkable for its strength, and flexibility.

Ivory. (Fr. *Ivoire*, Ger. *Elfenbein*. Sp. *Marfil.*)

The general name for the white dentine in the teeth and tusks of certain large animals, such as the elephant, narwhal, walrus, and hippopotamus. The ivory of commerce is chiefly obtained from the tusks of elephants, and is shipped mainly from Zanzibar and Pemba. It is estimated that about 40,000 elephants are killed annually in Central Africa in order to supply the European markets. Asiatic ivory, obtained in India, Further India, and in the Eastern Archipelago, is used in the regions where it is obtained, and very little is exported. African ivory is preferred to Asiatic, as its texture is closer, and it takes a much finer polish. Asiatic ivory is very white when fresh, but becomes yellow on exposure to the air. A small quantity of ivory is obtained from Siberia, being the tusks of the extinct mammoth. Ivory has always been a favourite substance for making ornaments, and it is in great demand for handles, pianoforte keys, billiard balls, carved figures, etc. The principal seat of the carved ivory trade is Dieppe, but nearly one half of the ivory used in manufacture is taken by England.

The value of ivory depends upon the size and quality of the tusks of the animals. In the trade they are classed according to weight. Large tusks are graded thus, those weighing over 60 lbs., those between 60 and 40 lbs., and those between 40 and 20 lbs. When the weight is less than 20 lbs. the tusks are called scrivelloes, and these are further divided as cut points and hollows. The price of ivory has been steadily rising for many years, and the upward tendency will be maintained as the sacrifice of elephants continues. For many purposes of manufacture celluloid is now coming into extensive use as a substitute for ivory.

Ivory Black. (Fr. *Noir d'ivoire*, Ger. *Beinschwarz*, Sp. *Negro de hueso.*)

An animal charcoal, obtained by heating the shavings of ivory in a closed iron cylinder. (See *Charcoal.*)

Ivory, Vegetable. (Fr. *Ivoire végétale*, Ger. *Holz-Elfenbein*, Sp. *Madera de marfil.*)

The product of a species of palm-tree, the *Phytelephas macrocarpa*, which grows in the Andean plains and along the banks of the Magdalena. The so-called ivory is obtained from the nuts of the palm, and are known also as Corozo nuts in commerce. The kernels of these nuts contain a substance which becomes very hard and white when the nuts are ripe, and which very closely resembles ivory in appearance. Several millions of the nuts are annually imported into Great Britain from Ecuador and the United States of Colombia, and are used in the manufacture of buttons, umbrella handles, knobs for doors, toys, etc. and for inlaying. The chief demand for vegetable ivory is by the turners of London and Birmingham.

Jaborandi. (Fr., Ger., and Sp., *Jaborandi.*)

The name of certain drugs obtained from various plants in South America. The name in Europe, however, is not given except to the drug extracted from the leaves of the *Pilocarpus pennatifolius*, and which is used medicinally for its diaphoretic properties, its value depending upon the presence of the alkaloid *pilocarpine*. Jaborandi

is sometimes employed by oculists, and it is considered efficacious in cases of Bright's disease.

Jacaranda. (Fr., Ger., and Sp., *Jacaranda.*)

A general name in Brazil for many species of rosewood which are grown there. The wood itself is very hard, heavy, and brown, and has a faint, agreeable, rose-like smell. It is extensively used by joiners and cabinet makers, and the whole supply is obtained from South America.

Jaconet. (Fr. *Jaconas*, Ger. *Jaconnet*, Sp. *Jaconet.*)

The name of a species of light soft muslin of an open texture, used for dresses, neck cloths, frills, ruffles, etc.

Jade. (Fr. *Néphrite*, Ger. *Nierenstein, Nephrit*, Sp. *Piedra nefritica.*)

A hard, compact, translucent mineral, of different shades of colour, white, yellow, green, etc., much prized in China, where it is found in considerable quantities. It is also found in Burmah and New Zealand. True jade, or nephrite, is a native silicate of calcium and magnesium, and has a specific gravity of 2·9. The Chinese work up this mineral into most beautiful ornaments, and there is a special jade market in Canton. Necklaces of green jade beads have been valued as highly as £1,000, and a single button often costs at least £10.

Jaggery. (Fr., Ger., and Sp., *Jaggery.*)

The name used in India for a variety of crude sugar obtained from the palm. The flowering shoot of the palm is bruised and the exuding juice collected. When boiled down this juice yields the brown sugar called jaggery. Toddy is prepared from the same juice, and in distillation arrack is obtained.

Jalap. (Fr. *Racine de Jalap*, Ger. *Jalapenknollen*, Sp. *Jalapa.*)

The well-known purgative, obtained from the dried tubers of the *Exogonium Purga*, a native of Mexico. It derives its name from the city of Galapa, where it is found in great plenty. The jalap used in medicine consists of the tubers reduced to a fine powder. The odour is faint and disagreeable, and the taste very unpleasant. The main ingredients of the jalap root are starch, sugar, lignin, and a substance known as jalap resin, the value of the root mainly depending upon the presence of the last-named. Jalap is sometimes administered alone, but more frequently in combination with calomel or cream of tartar.

Jamaica Pepper. (See *Pimento.*)

Jamun.

The fruit of the *Syzygium Jambolana*, an Indian plant. It is a species of long dark-coloured plum and about the size of a large date. Its taste is sharp, but it makes an excellent preserve, the flavour of which resembles the flavour of black currant jelly. Large quantities of the fruit are sent from India to England, and besides its use as a substitute for black currant jam it is employed to flavour other jams. A coarse liquor is obtained from the distilled fruit.

Japan Wax. (Fr. *Cire japonaise*, Ger. *Japanisches Wachs*, Sp. *Cera japonesa.*)

The vegetable wax obtained from the leaves, branches, and small berry fruit of the *Rhus succedanea*, a Japanese plant. It is extracted by boiling the parts of the plant in water, and forms masses or blocks of a whitish colour, though with a yellowish green tint. Its odour is somewhat unpleasant, resembling that of tallow. It has a bitter taste and affects the throat. Japan wax is more unctuous than ordinary beeswax, but it is more easily worked. Although it is an article of commerce the amount imported into Great Britain is very slight.

Japanned Wares. (Fr. *Marchandises japonaises*, Ger. *Japanische waaren*, Sp. *Mercaderias Japonesas.*)

Articles of wood, metal, and papier maché coated with varnish or lacquer and hardened by heat. The art of japanning is carried to perfection in Japan, hence its name. A good brown japan, as it is called, is prepared by heating separately equal proportions of amber or copal resin and asphaltum, and adding to each one half of the quantity by weight of boiled linseed oil. The compounds are then mixed together. Japanning is most largely carried on with tinned iron goods. For these brown and black colours are mostly used, but both are obtained by the use of brown japan, the metal receiving a preliminary

coating of black paint when black is required. Cheap goods are only coated once, but for better class goods two or three coatings are applied. After coating, the articles are heated in an oven for about twelve hours. The surface is then successively rubbed with ground pumice stone, rotten-stone, and the palm of the hand. The decorative work is afterwards carried out, gold or bronze being generally added. Japanned wares are turned out in large quantities at Birmingham, the commonest kinds being tea-trays, coal-boxes, canisters, etc. White japan is often used to give the internal finish to portable baths. When papier maché wares are japanned it is usual to work shell or metal inlaying into the japan.

Jarrah. (Fr., Ger., and Sp., *Jarrah.*)

A valuable timber obtained from the *Eucalyptus rostrata* and the *Eucalyptus marginata*, trees which grow somewhat extensively in Western Australia. When the wood is sound and the trees are felled at the proper season, jarrah is of great value for use as wharf piles, railway sleepers, and telegraph posts, owing to the presence of a pungent acid which repels certain destructive insects. It is also employed for the parts of ships below the water line, and the use of jarrah planks dispenses with the necessity for copper sheathing. The timber has long been used as a kind of mahogany in Western Australia, and it is now being exported in large quantities to the other parts of the Australian Commonwealth and to India.

Jasmine. (Fr. *Jasmin*, Ger. *Jasmin*, Sp. *Jazmin.*)

A name of several species of shrubs or climbing plants, highly prized on account of their fragrant flowers. They are chiefly found in sub-tropical countries. From the flowers an oil is extracted which is valuable in the preparation of a number of perfumes, and is sometimes used medicinally for a variety of children's complaints. The commercial oil of jasmine, however, is generally oil of ben or some similar substance flavoured with jasmine.

Jean. (Fr. *Coutil satiné*, Ger. *Barchent*, Sp. *Bombasi, Fustan.*)

Cloth made of twilled cotton, and sent in large quantities from Manchester and the surrounding district to China. Satin jean is a jean woven smooth and glossy after the manner of satin.

Jerked Beef.

Salted or sun-dried meat, prepared in South America, Mexico, and Texas. It is probably of Chilian origin, and its South American name is "chorqui." In Mexico it is known as "tasago." About 50,000 tons are annually used in Brazil and the West Indies as food for negroes. At one time Uruquay sent a large quantity of jerked beef to Great Britain, but neither here nor on the continent of Europe did it find much favour, and frozen meat has practically ousted it from European commerce.

Jesuits' Bark.

(See *Cinchona.*)

Jet. (Fr. *Jais*, Ger. *Gagat*, Sp. *Azabache.*)

A lustrous mineral, a species of pit coal resembling cannel coal, of a deep brown or velvety black colour. Its structure, chemical composition, and origin have not yet been fully investigated. The largest supplies are obtained at Whitby, in Yorkshire, where it forms part of a thick bed of lignite, and where some 40,000 or 50,000 lbs. are annually worked in making ornaments and mourning jewellery, the value of which exceeds £100,000. In other parts of the world jet is found in small, thin, detached layers in bituminous shales, principally in Bohemia, the Baltic provinces, and Spain. In the last named country the centre of the jet industry is Oviedo. The substance is valued as being light, capable of being easily worked, and of taking a high polish. It is, however, somewhat brittle. Until recently Whitby had almost a monopoly of the jet trade, but it is now feeling the effects of foreign competition. Imitations of jet ornaments are made of hardened india-rubber called vulcanite or ebonite, and also of a species of glass.

Jewellery. (Fr. *Bijouterie*, Ger. *Juwelen, Juwelierwaren*, Sp. *Joyos.*)

Articles manufactured in precious metals, precious stones, and other valuable materials, used for the purposes of personal adornment. The

principal materials used are gold, silver, diamonds, emeralds, rubies, garnets, amethysts, pearls, coral, topazes, cairngorms, and agates. The work upon each of these constitutes a special industry, and is carried on in various parts of the world. Amsterdam is the centre of the diamond cutting trade, while Paris, Vienna, and New York produce novelties in jewellery in rapid succession. In England Birmingham is the city in which most of the cheaper jewellery is made, and almost all the imitation jewellery in general use. In the better classes of jewellery the manufacturers of Clerkenwell, in London, have the highest repute in the United Kingdom.

Jew's Ear. (Fr. *Éponge de sureau*, Ger. *Hollunderschwämme*, Sp. *Esponja de sahuco.*)

The name given to a species of fungus, *Excidium auricula Judae*, which grows on the decaying parts of living trees, especially elders. The dried fungus was formerly much used in medicine as an astringent, Another species serves as a food in China and Japan.

Job's Tears. (Fr. *Larmes de Job*, Ger. *Hiobsthränen*, Sp. *Lagrimas de Job.*)

The hard, shining, grey seeds of the *Coix Lachryma*, a grass of India, which grows to the height of about 8 feet, and somewhat resembles maize. The seeds are edible, and are also reputed to have certain medicinal value, but they are mainly prized for making ear-rings, necklaces, and bracelets, and for adorning the dresses of the Indian natives. The plant has been introduced into Spain and Portugal, and the seeds have been employed in the manufacture of rosaries and other ornaments. The name is derived from the shape of the seeds, which resemble heavy tear-drops.

Jonquil. (Fr. *Jonquille*, Ger. *Jonquille*, Sp. *Junquillo.*)

A species of narcissus or daffodil, with rush-like leaves. It is an exceedingly common garden plant. An essential oil is extracted from the flowers of the *Narcissus jonquilla*, and the *narcissus odorus*, which is extensively used in the preparation of a perfume. The oil is obtained by steeping the flowers in ether, and is yellow in colour.

Jowarri. (Fr., Ger., and Sp., *Jowarri.*)

The Indian name for the large seeded millet, *Sorghum valgare*, used as a food by the natives, and exported for feeding cattle. The exports from India exceeds half a million hundredweights per annum.

Juniper. (Fr. *Genièvre*, Ger. *Kranewit*, Sp. *Junipero.*)

The name of several evergreen trees or shrubs belonging to the natural order *coniferae*. The berries or fruit of the common juniper, which is quite common in Europe, Asia, and North America, are of a bluish colour, and are used for flavouring gin. The name gin is, in fact derived from the French name of the juniper. From the berries an essential oil is obtained by distilling the unripe fruit with water. This oil is a limpid and almost colourless substance. If the berries are ripe the oil becomes rancid and has the flavour of spirits of turpentine. The tree known as the Virginia Juniper is valuable on account of its beautiful reddish wood. This wood is much employed in the manufacture of cigar boxes and lead pencils owing to the scarcity of the Bermuda Cedar. The timber of another juniper, which flourishes in the Himalayas, is extensively used in India by turners and cabinet makers.

Junk.

Old pieces of hemp, rope, and cordage, cut into short lengths, and used for making rope mats, ship sacks, oakum, and thick brown paper.

Jute. (Fr. *Jute, Chanvre de l'Inde*, Ger. *Jute, Jutehauf*, Sp. *Juta.*)

Jute is an important Indian fibre, obtained mainly in Calcutta from two very similar species of plants *Corchorus capsularis* and *Corchorus olitorius*. The fibre is the inner bark of the plant, and is separated from the woody stalk by steeping in water. Sometimes the jute is placed in rivers, but more generally in tanks or stagnant pools. Previous to steeping, the stalks are stacked for a few days in order to allow the leaves to decay. After the separation the fibre is washed in water, then dried in the sun, and afterwards done up in small bundles. In Calcutta it is pressed into bales for exportation, and shipped in enormous

quantities to Dundee. The best qualities of jute have a brownish yellow tint and a silky lustre. This colour is only discharged with great difficulty by bleaching. The fibre takes brilliant dye colours readily, but they are somewhat fugitive.

It is only within the last half century that jute has become so important an article of commerce. In India the fibre had long been used for the manufacture of gunny bags (*q.v.*) and native clothing, but in Europe it was not much in favour until the great improvement in the spinning machinery made its working easy. Since 1850 Dundee, outside India, has had the greatest trade in the article. It is believed that if some better method could be discovered of separating the fibre from the stalk the quality of the jute manufactures would be vastly improved.

In Dundee the most common fabrics made from jute are Hessians, sackings, mattings, tarpaulins, floorcloths, and inferior classes of carpets. Millions of small, brightly-dyed prayer carpets for Mahometans are exported from Dundee. On account of its glossy nature, jute has been much used in adulterating or imitating silk textures. It is also employed in the manufacture of stage wigs, tresses, and ladies' hair pads.

The processes of preparing, spinning, and weaving jute are very similar to those used for flax, but the machinery required is of a heavier description.

Juvia. (Fr., Ger., and Sp., *Juvia.*)

A local name for the Brazil nut of commerce.

Kaat.

The name given to Abyssinian tea, the leaves of the *Catha edulis* and the *Catha spinosa*. By the natives of Abyssinin and Arabia these leaves are chewed as a stimulant and exhilarant, as they produce the same effects as coffee. The two species of kaat are known as Subbari and Muktare, according to the districts from which they are obtained. There is practically no European commerce in this substance, though the trade done at Aden is not inconsiderable.

Kaffir Corn.

The name given in South Africa to the grain of a species of Davia.

Kainite. (Fr. *Kaïnite*, Ger. *Kainit*, Sp. *Kainite.*)

A mineral found in the Strassburg deposits of Germany. It is a hydrated compound of the chlorides and sulphates of magnesium and potassium. It is used to a considerable extent as a manure.

Kale. (Fr. *Chou*, Ger. *Kohl*, Sp. *Berza, col.*)

An open-leaved variety of the cabbage plant known as *Brassica oleracea*. It is cultivated as a winter and spring vegetable. Sea kale is the blanched stems of the *Crambe maritima*, and considered a choice vegetable.

Kali. (Fr. *Kali*, Ger. *Kali*, Sp. *Cali.*)

A name often applied to a soluble tartrate of potash

Kamala. (Fr. *Kamala*, Ger. *Kamala, Wurus*, Sp. *Kamala.*)

Also known as wurrus. A fine orange coloured powder obtained from the minute glands which cover the seed capsules or ripe fruit of an Indian tree known as *Mallotus Philippensis*. The powder is used in India as a dye for silk, to which substance it imparts a fine orange colour. It has also some medical value as a purgative. The imports into Great Britain from India are small in quantity.

Kangaroos. (Fr. *Kanguroos*, Ger. *Kängaruhe*, Sp. *Kangaroo.*)

About 500,000 kangaroo skins are annually exported from Australia to Great Britain and the United States. The leather made from the skins is suitable for strong light boots, and for the manufacture of gloves. The flesh of some kinds of kangaroos makes excellent food, and kangaroo tail soup is largely manufactured for use on shipboard. The furs of the smaller animals are valued in certain markets.

Kaolin. (Fr. *Kaolin*, Ger. *Kaolin, Porzellanerde*, Sp. *Kaolin.*)

A very pure white clay, commonly known as China clay. Its name is derived from Kauling, a hill in China where the substance was first found, and near which it was first used in the manufacture of porcelain. Kaolin is the result of the decomposition of felspar, water replacing the potash and part of the silica. On account of its purity it is valuable in the manufacture of china and the finest kinds of porcelain, and it is also used by paper makers. For a long period the only

supplies were obtained from China and Japan, but in 1755 kaolin was discovered in Cornwall. The chief British supplies are now derived from that county, about 30,000 tons being used annually. There are deposits near Limoges in France, and in Nebraska, in the United States.

Kapok. (Fr., Ger., and Sp. *Kapok.*)

The Dutch name for a species of short silky cotton stuff surrounding the seeds of the *Bombax malabaricum.* The tree grows in the Dutch East Indies, and many hundreds of bales of kapok are annually exported to Holland for upholstery purposes, filling beds, pillows, coverlets, etc.

Kauri. (Fr., Ger., and Sp., *Kauri.*)

The native name for the pine tree, *Dammara australis*, which flourishes in New Zealand. The tree is of great size and beauty, sometimes rising to the height of 150 feet. The timber is white or straw-coloured, close-grained, durable, and very easily worked. It is valuable for masts, yards, and planks, and is largely exported. There are several species of a similar tree in the Pacific Islands. The kauri pine yields a resin, sometimes also known as Kauri gum, which is valuable in the manufacture of varnishes. One half of the exports from Auckland are sent direct to Great Britain, the greater portion of the remainder going direct to the United States.

Kekune Oil. (Fr. *Huile de kekune*, Ger. *Kekuneöl*, Sp. *Oleo de kekune.*)

The fixed oil, thin, odourless, and tasteless, obtained from the seeds of the *Aleurites triloba*, by boiling them in water. It is used medicinally as a mild purgative.

Kelp. (Fr. *Caillotis*, *Varech*, Ger. *Seegras*, *Tangasche*, Sp. *Alga.*)

The ash of burnt seaweed from which at one time soda was obtained in large quantities, but which is now valuable as the source of iodine and bromine. The substance consists of sulphates, potassium, and magnesium, and contains small quantities of iodine and bromine in combination with sodium and magnesium. The preparation of kelp was once a great industry on the west coast of Scotland, but the present production does not amount to 10,000 tons per annum in Great Britain, to obtain which some 200,000 tons of seaweed are required. The value of kelp is about £4 per ton. A considerable quantity is also obtained in N.W. France. The iodine and bromine are obtained from the mother liquor which remains after kelp has been dissolved in water and the sulphates, carbonates, and chlorides have been separated by evaporation and crystallization.

Kermes. (Fr. *Kermès*, Ger. *Kermes*, *Scharlachbeere*, Sp. *Kérmes.*)

Also known as Alkermes. The name of a dye stuff obtained from the dried bodies of certain female insects which live on a species of oak, *Quercus coccifera*, abounding in Southern Europe. Kermes is a brilliant scarlet dye, closely resembling cochineal, and has been in use from very remote times. Its use is now confined to the districts where the insect is found owing to the introduction of aniline dyes. The name kermes, or kermesite, is also given to a cherry-red mineral, not very commonly found in Central Europe. It consists of a mixture of sesquioxide and sesquisulphide of antimony. When ground into powder this mineral is sometimes used as a veterinary medicine.

Kerosene. (Fr. *Kérosène*, Ger. *Kerosin*, Sp. *Kerosene.*)

The general name applied to mineral oils, whether petroleum, paraffin, or shale oils, which are used in various countries for burning in lamps. In America the name kerosene is most generally applied to petroleum oil refined for domestic use. It is exported from America, Russia, and Great Britain, principally to India and China. It is a dangerous substance, as ordinary kerosene emits an inflammable vapour at 86° Fahr.

Kid Skins. (Fr. *Peaux de chevreau*, Ger. *Ziegenhäute*, Sp. *Piel de cabra.*)

The skins of young goats which are valuable in the manufacture of gloves.

Kidderminster.

The name of a species of carpets, so called from the town where they were first made. (See *Carpets.*)

Kimmel. (Fr. *Kimmel*, Ger. *Kümmel*, Sp. *Kimmel.*)

Or Kümmel. A continental liqueur. It is made from brandy flavoured with cummin or coriander seed.

Kimmeridge Clay. (Fr. *Argile de Kimmeridge*, Ger. *Kimmeridge thon*, Sp. *Arcilla de Kimmeridge.*)

A dark, bluish-gray, shaly clay, found chiefly at Kimmeridge in the Isle of Purbeck, rich in bituminous matter and sometimes used as fuel.

Kinderscout Grit.

Coarse grits and flagstones which are quarried at Eyam, in Derbyshire, and used for engine-beds, foundations, and reservoir works. They occur towards the base of the Millstone Grit which forms the tableland of the Peak district.

Kingwood.

A beautiful cabinet wood, obtained from a species of *Dalbergia.* It is imported from Brazil in trimmed logs of from two to seven inches in diameter. Kingwood is sometimes known as violet wood because of the streaked tints of that colour with which it is marked.

Kino. (Fr. *Gomme de Gambie, Kino*, Ger. *Kino*, Sp. *Kino.*)

The astringent red or brown resin obtained from several species of trees which are found in Africa, India, and Australia. The best is derived from the exuding sap of the *Pterocarpus marsupium*, of Madras and Ceylon. On exposure to the air the sap hardens, and then dries in angular pea-like grains. It contains about 75 per cent. of tannic acid. The Bengal kino, obtained from the *Butea frondosa*, is used by the natives for tanning leather. Medicinally it is used much as catechu, and is valuable in cases of diarrhœa and chronic dysentery. It is also employed in India as a yellowish brown cotton dye.

Kirschwasser. (Fr., Ger., and Sp., *Kirschwasser.*)

Also known as kirsch and kirschenwasser. A liqueur manufactured on the Continent, especially in Germany, Holland, and Denmark, made from cherries. The juice of cherries is mixed with strong spirit, sweetened with sugar, and often flavoured with the essential oil of bitter almonds and other aromatics. Another method of obtaining the liqueur is by distillation from the cherries crushed with their kernels and allowing the liquid to ferment. The name signifies cherry water.

Kitt Fox.

The name of the smallest of all the American foxes, of which between 5,000 and 10,000 skins are annually imported into Great Britain.

Kittool.

Otherwise known as Indian gut. It is a fibre obtained from the leaf of a Ceylon palm tree, the *Caryota ureas.* It is used in Great Britain for making fishing lines, and also for brush making.

Kohl Rabi.

A curious variety of cabbage, having a stalk resembling that of a turnip. It is used extensively as a cattle food, and forms a very common field crop in Sweden. It is not much cultivated in Great Britain.

Kokra Wood. (Fr. *Bois de Kokra*, Ger. *Kokraholz*, Sp. *Madera de Kokra.*)

Or Cocus Wood. The wood of a certain species of elder tree which grows in many districts of India. It is exceedingly hard and of a rich deep brown colour. In the East it is used for many purposes by wood turners, and in Europe it is employed in the manufacture of various musical instruments, especially flutes. It is imported from India in logs of from 6 to 8 inches in diameter.

Kokum Butter.

The fat extracted from the seeds of the *Garcinia purpurea*, an Indian plant. It is a semi-solid substance, and is used medicinally in the making of ointments, etc.

Kola-Nuts. (Fr. *Noix de kola*, Ger. *Kolanüsse*, Sp. *Nuez de kola.*)

The seeds or fruit of the *Sterculia acuminata*, a much prized tree which grows extensively in tropical Africa. The nuts are also known as Guru nuts. By the natives of West Africa these nuts are chewed on account of the alkaloid they contain, the alkaloid being identical with that found in tea and coffee. They are useful in allaying the pangs of hunger and thirst, and are considered to give great sustaining powers to those who use them. Medicinally the nuts are employed in cases of diarrhœa and affections of the liver. Large supplies are shipped from the Gambia to France and Germany, where they are used to adulterate cocoa and chocolate.

Kolinski. (Fr., Ger., and Sp., *Kolinski.*)

The skins of the Tartar sable, obtained in Siberia and sent to various European markets for the purpose of being made into cloaks and mufis. The largest trade in these skins is done at Leipsic. The hair of the tail of this sable is used for making paint brushes.

Koumiss. (Fr. *Koumiss*, Ger. *Kumiss*, Sp. *Koumiss.*)

A fermented liquor made in Russia from mare's milk. A spirit, called rack, is distilled from it. In England an artificial koumiss has been manufactured from ass's milk, and it is supposed to be efficacious in cases of consumption.

Kukui Oil. (Fr. *Huile de kukui*, Ger. *Kukuöl*, Sp. *Oleo de kukui.*)

The oil obtained from the candle nut, *Aleurites tribboa*, a tree of the Pacific Islands. The oil is used by the islanders for illuminating purposes, and it is imported in small quantities for its drying qualities when mixed with various colours.

Kundah Oil. (Fr. *Huile de kundah*, Ger. *Kundahöl*, Sp. *Oleo de kundah.*)

The concrete oil obtained from the seeds of the *Carapa guineensis*, a species of tree found in West Africa. Besides its native use for lighting it is sometimes used medicinally as a purgative.

Kuskus.

The fibrous roots of the *Andropagon muricatus*, a grass grown in the East Indies. The roots are useful as a perfume and for driving away moths. An oil known as vitivert is obtained from the root, and is used in the manufacture of various perfumes.

Labdanum. (Fr., Ger., and Sp., *Labdanum.*)

A black-brown, soft, and delicately scented gum, the exudation of the *Cistus creticus*, growing in Crete, Cyprus, and Asia Minor. In medicine it was once used as a stimulant and expectorant, but it is now simply employed in perfumery, being held in much esteem in Turkey. It is an article rarely met with in England.

Lac. (Fr. *Laque*, Ger. *Lack*, Sp. *Laca.*)

A resinous incrustation found on certain trees in India, especially trees of the *ficus* genus. It is formed by the insect *Coccus lacca*. The twigs upon which the deposit is formed are sometimes covered to the thickness of a quarter of an inch, and the lac has the appearance of an irregular outer layer of bark with a rough surface. In its natural state it is known as stick-lac. After having been removed from the trees upon which it is found, stick-lac is placed in tubs of water and beaten. It is then called seed lac. The water is coloured red by the bodies of the insects enclosed in the incrustation, and after evaporation lac dye is obtained, a substance used for dyeing silk and leather. Good lac dye contains about 50 per cent. of colouring matter and 25 per cent. of resin. The seed lac is melted in cotton bags before a charcoal fire, and by various treatment the shellac of commerce is obtained.

Lac has many important uses. It is largely employed in the manufacture of polishes and varnishes, for stiffening the calico frames of silk hats, and for making the best sealing-wax. In the East it is made up into various ornaments, and used as a coating for wooden toys. In China it is extensively used to decorate the surfaces of boxes, trays, vases, and other similar articles.

Lace. (Fr. *Dentelles*, Ger. *Spitzen*, Sp. *Encaje.*)

The open ornamental fabric of linen, cotton, silk, or gold and silver threads, constructed by looping, twisting, or plaiting the threads into definite patterns. There are three distinct varieties of lace known, as point lace, pillow lace, and machine lace. The first two are made by hand, another name for point lace being needle lace, which is closely allied to embroidery. Pillow lace is so called because it is manufactured with the aid of a large stuffed cushion into which pins are placed according to the pattern desired, and round which pins the lace thread is plaited from a number of small bobbins.

The manufacture of hand-made lace is an extremely delicate and complex operation. It is carried on at various places in France and Belgium and the varieties are known as Valenciennes, Lille, Mechlin, Cluny, and Brussels. The best point or needle lace is *point d'Alençon*, and some of the Brussels lace, which is also needle-made, is distinguished as *point à l'aiguille*. The greater portion, however, of Brussels

lace is a pillow made fabric. Other well-known varieties of hand-made lace are Maltese and Honiton.

There is a large business done in the manufacture of machine-made lace in England, Nottingham being the centre of the trade. The imitation of hand-made lace is excellent, and lace-making machines are among the greatest triumphs of mechanical ingenuity. The lace made is almost exclusively for home consumption, the exports being inconsiderable.

Lacquer. (Fr. *Laque Vernis*, Ger. *Lackfirnis*, Sp. *Barniz de la China.*)

A varnish prepared by dissolving seed lac or shellac in alcohol, with the addition of small quantities of one or more gum-resins, such as sandarach, amber, etc. The yellow or orange colouring matter is supplied by gamboge. dragon's blood, and other substances. The varnish is applied to brass and gilded articles so as to heighten their colour and to prevent tarnishing, and the process of lacquering is very much like that of japanning. The brass or other object which is to be lacquered is first coated when cold. It is then heated in a stove, after which a second coating is applied. When black lacquering is needed, the brass is bronzed and coated with black lead before the lacquer is applied.

The lacquer ware of Japan is made in a different manner. Their lacquer is the sap of the lacquer varnish tree, the *rhus vernicifera*, and it is applied almost exclusively to wooden articles. Unlike the European lacquer this coating will bear the application of great heat without injury. The Japanese have attained great renown for their skill in this sort of work, and the specimens of cabinets, trays, boxes, etc., are often of exceptional beauty and elaborate finish.

Lamb Skins. (Fr. *Peaux d'agneau*, Ger. *Lämmerfelle*, Sp. *Piels de cordero.*)

Included in the returns of imports under sheep skins. The skins of lambs are now extensively used as a substitute for kid skins in the manufacture of gloves. The best supplies are derived from Hungary, Greece, and Southern Russia, the black varieties coming from the last named, especially from the Crimea and Astrakan.

Lametta. (Fr., Ger., and Sp., *Lametta.*)

An Italian name for foil or wire made from copper or from the precious metals.

Lamp Black. (Fr. *Noir de fumée*, Ger. *Lampenruss*, Sp. *Hollin.*)

The intensely black pigment formed of the soot or amorphous carbon obtained by burning such substances as resin, petroleum, or tar. The best is obtained from the combustion of camphor. In the United States lamp black has also been made by the imperfect combustion of natural gas. This pigment is useful for artists in oil and water colour. The commonest kind is used by house painters. It is a most important substance in the preparation of printing ink, Indian ink and carbon paper. Some curriers employ it in the preparation of certain kinds of leather.

Lancewood.

A strong, light, and elastic wood obtained from two species of trees which grow in the West Indies, mainly in Jamaica. The valuable part of the tree is the main trunk, which is remarkably straight, and seldom more than 9 inches in diameter. Lancewood is principally used by coach-builders for shafts and carriage poles. It is also employed in the manufacture of billiard cues and archers' bows. Owing to its limited supply the prices charged for this wood are exceedingly high.

Lanoline. (Fr. *Lanoline*, Ger. *Lanolin*, Sp. *Lanoline.*)

An unctuous substance obtained in the washing of wool. It is a mixture of the ethers of cholesterin with fatty acid, and is used as the basis of ointments and in the manufacture of the cheaper kinds of soap.

Lapis Lazuli. (Fr. *Lapis-lazuli*, Ger. *Lasurstein*, Sp. *Lapis-lazuli.*)

A mineral of beautiful blue colour, consisting principally of silica and alumina, with the addition of a small quantity of sulphuric acid, soda, and lime. It is generally found massive, and associated with crystalline limestone, the finest specimens being obtained from Bokhara. It is much employed in ornamental and mosaic work, and for church ornamentation, especially altars. When powdered it constitutes the beautiful colour known

as ultramarine. The cost, however, of obtaining ultramarine from this mineral is so great that the colour is now prepared artificially.

Larch. (Fr. *Mélèze*, Ger. *Lärchenbaum*, Sp. *Alerce.*)

A kind of fir tree, grown extensively in most parts of Europe, and valuable for its timber, which is exceedingly durable, not liable to rot on exposure, and free from insect destruction. Larch bark is used for tanning. One species of the tree, found in Siberia, yields a kind of gum which is employed in the manufacture of numerous cements.

Lard. (Fr. *Saindoux*, Ger. *Schweine schmalz*, Sp. *Sain de puerco.*)

The congested fat of the pig, generally mixed with a small quantity of salt in order to improve its keeping qualities. This substance is exported in enormous quantities from America, in bladders, kegs, and barrels. Besides its use for culinary purposes and for making ointments, recently discovered processes have rendered it possible for stearine and oleine to be extracted from lard when it is pressed at a low temperature. The former is valuable in the manufacture of candles, and the latter, under the name of lard oil, has come to be recognised as a useful lubricant for machinery.

Lastings.

A common name for certain plain or figured fabrics, made either in wool or cotton.

Latakia. (Fr., Ger., and Sp., *Latakia.*)

The name of a Turkish tobacco, the product of the *Nicotiana rustica*, which grows in the hilly districts behind Latakia, in North Syria.

Laths. (Fr. *Lattes*, Ger. *Latten*, Sp. *Latas.*)

Thin strips of wood, from 3 to 6 feet long, 1 inch broad, and ¼ inch thick. They are used by builders for walls and ceilings to retain the covering of plaster.

Latten. (Fr. *Fer blanc, Étain en feuille, Cuivre jaune fin*, Ger. *Messingblech*, Sp. *Lámina de laton.*)

The name given to brass or bronze used for crosses, and also to tin rolled out into plates.

Laudanum. (Fr. *Laudanum*, Ger. *Opiumtinktur*, Sp. *Laudano.*)

The commonest of all the preparations of opium, and often called tincture of opium. It is a liquid of a darkish red colour. Laudanum is obtained by steeping opium, sliced or powdered, in dilute spirit and filtering the whole after it has been allowed to stand for a period of time, varying with the strength required. It is a powerful anodyne and soporific, but except in very small doses it may act as a dangerous poison.

Lavender. (Fr. *Lavande* Ger. *Lavendel*, Sp. *Alhuzema, Espliego.*)

The flower-heads of the *Lavendula vera*, from which, as well as from the stalks, an essential oil is obtained by distillation. Though the plant is grown in Great Britain, the French oil is that which chiefly enters into commerce as it can be prepared more cheaply in France than in England. The oil is used as a tonic in medicine, and it is very frequently mixed with other medicines. The flowers are often put into wardrobes to drive away moths, and they are also used in the manufacture of perfumes, especially lavender water, which is composed of oil of lavender, rectified spirits of wine, and a few additional essences. From a particular species of lavender, known as broad-leaved lavender, and found in the south of Europe, an oil known as spike oil is obtained, which is employed by painters on porcelain and in the manufacture of varnishes.

Lawn. (Fr. *Linon*, Ger. *Battist, Linon*, Sp. *Linó.*)

A fine kind of cambric, made chiefly at Belfast. (See *Linen.*)

Lead. (Fr. *Plomb*, Ger. *Blei*, Sp. *Plomo.*)

One of the most useful of metals, used very extensively as sheet lead, for piping, for the manufacture of bullets, etc. It is a bluish gray metal, remarkable for its softness and fusibility. Its specific garvity is 11·36. When freshly cut it possesses a bright metallic lustre, but it quickly tarnishes on exposure to the atmosphere. It is not a good conductor either of heat or electricity.

The chief source of lead is the ore galena, a sulphide of lead found in several European countries. In Great Britain the chief lead supply is obtained from the mines of Cumberland,

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but there is a considerable amount of galena imported from Spain. The galena is crushed and washed to remove earthy impurities, and then melted with proper fluxes in a reverberatory furnace. Owing to the presence of small quantities of other metals, there are several special additional processes necessary in order to obtain the lead pure.

Lead enters into the composition of several useful alloys, of which the most important are type metal, stereo metal, plumbers' solder, pewter, and shot metal. An oxide of lead, known as red lead or minium, is much used in the manufacture of fluid glass, as a cement, and as a pigment. A mixture of lead oxide and antimony, known as yellow lead, is employed as a pigment for giving a yellow colour to earthenware. White lead, a substance extensively employed as a pigment and for pottery glazes, is a carbonate of lead. It is obtained by subjecting thin sheets of the metal to the simultaneous action of acetic acid and carbonic acid gas.

Leather. (Fr. *Cuir*, Ger. *Leder*, Sp. *Cuero.*)

The skins or hides of animals, especially the larger mammals, prepared by certain chemical processes so as to preserve them from decomposition and putrefaction, and to give them increased strength, toughness, and pliancy, together with insolubility in water. There are several distinct methods of preparing leather, but all depend upon the combination of the tannic acid of some tannin material with the gelatinous substance of which the skins or hides are largely composed. The skins of all animals can be made into leather, but in practice only a limited number are utilized. Besides those skins and hides obtained from local slaughter-houses there are enormous annual supplies imported from Australia, South Africa, and South America. Buffalo hides are exported by the East Indies, horse hides are obtained from South America, and goat skins and kid skins from the Cape, Switzerland, and Asia Minor.

In the preparation of leather the hides are first steeped in water, and allowed to soak for some time, so as to get rid of all blood, salt, and other extraneous substances. The hair is next loosened and removed, and whatever fat remains is taken away by the action of limewater and sulphide of sodium. In America a plan of sweating the hides is adopted instead of steeping them in pits. The next process is to stretch the hides so as to open the pores and make the material capable of absorbing the tannin. They are then placed in a solution containing the tanning substance to be used, which is made stronger and stronger as time goes on. After remaining some weeks thus steeped, the hides are carefully drained and dried. The drying process is one that needs the utmost care, as the quality of the leather depends so much upon it. The finishing touches are now supplied by very efficient machinery, especially graining and smoothing.

Of the various special kinds of leather, Morocco leather is the name applied to the skins of goats tanned with sumach. Roan leather is prepared from sheep skins treated in the same way as Morocco leather. Russia leather is smooth finished leather, impregnated with the oil of birch bark, from which it derives its peculiar odour. Chamois leather, originally made from the skin of the chamois, is a kind of soft leather prepared from sheep skins by treatment with oil alone. The skin is not tanned at all.

The uses to which leather is put are very numerous—boots, shoes, gloves, saddlery, etc. The manufacture of leather and leather goods is a most important British industry, and the value of the unwrought leather imported, and of the finished leather goods exported, has grown enormously in recent years. There are one or two public sales of leather in London every month, and there are quarterly leather fairs at Leeds in January, April, July, and October.

Leather cloth is a textile fabric, which somewhat resembles leather, but is a material having unbleached calico for its background, and being coated with boiled oil, dark pigments, and other ingredients so mixed as to be capable of being uniformly spread over the cloth by rollers. It is often known as American cloth. It is often used as a covering for chairs, sofas, desks,

etc., and a thicker kind is employed for covering coaches.

Leek. (Fr. *Poireau, Poireàu*, Ger. *Lauch*, Sp. *Puerro.*)

A cultivated variety of the *Allium ampeloprasum*, a member of the onion family, much valued for culinary purposes. It is very generally cultivated in Scotland and Wales, and grows to a considerable size if planted in a deep soil with a dry bottom.

Lemon. (Fr. *Citrôn, Limon*, Ger. *Citrone*, Sp. *Limon.*)

The fruit of the *Citrus limonum*, a small tree commonly found in the south of Europe. The supplies of northern Europe are entirely obtained from Mediterranean ports. The peculiar and pleasant flavour of the lemon is due to the citric acid contained in the juice of the fruit. The lemon juice is obtained by pressing the fruit, and it has become of great value in medicine owing to its anti-scorbutic properties. Sicily does a large trade in this article. The peel of the lemon produces a volatile oil and is also used as a condiment. The oil has the same composition as turpentine, $C_{10}H_{16}$, but it contains a small quantity of other oils. Besides its use as a flavouring substance it is employed in the manufacture of various perfumes, especially Eau de Cologne. Lemonade is an aerated water flavoured with sugar and essence of lemons.

Lemon Grass. (Fr. *Schenante, Jonc odorant*, Ger. *Citronenkraut*, Sp. *Melisa.*)

A perennial grass, cultivated in Ceylon and the Straits Settlements, with a lemon-like fragrance, from which a volatile oil, sometimes called oil of verbena, is extracted. This oil is used in the manufacture of perfumes.

Lentils. (Fr. *Lentilles*, Ger. *Linsen*, Sp. *Lentejas.*)

A leguminous plant closely related to the vetch. It is extensively cultivated in Egypt, Syria, and southern Europe generally. From the seeds a palatable and nutritious food is obtained. In the East they are cooked as a sort of porridge. In Great Britain the lentil seeds are used for the preparation of invalids' food, especially the food known as Revalenta Arabica, and in the lists of imports they are included with tares. The principal exporting country is Egypt. The cultivation of the plant in England has been frequently suggested, but the attempts have not been successful owing to the absence of sufficient warmth.

Leopard Skins. (Fr. *Peaux de léopard*, Ger. *Leopardenfelle*, Sp. *Piel de leopardo.*)

Used for rugs. About 1,000 skins are annually imported from India.

Letter Wood. (Fr. *Bois de léopard*, Ger. *Leopardenholz*, Sp. *Madera de leopardo.*)

Also called leopard wood and smoke wood. It is procured from a large tree belonging to the bread fruit, a native of British Guiana and Trinidad. The wood is beautifully mottled and streaked with black spots, and is very effective when polished. It is used for making cabinets, for fine veneering, and for inlaying work. Owing to the small supply the price is high.

Lettuce. (Fr. *Laitue*, Ger. *Lattich*, Sp. *Lechuga.*)

The well-known garden vegetable used in the preparation of salads. It is a plant belonging to the order *Compositae*, the cultivation of which is widespread. The garden lettuce is the result of long cultivation. There are two principal varieties, the cabbage and the cos, the former having round leaves and a growth somewhat like a small cabbage, the latter possessing upright oblong leaves.

Lign Aloes. (Fr. *Bois d'aloes*, Ger. *Aloeholz*, Sp. *Madera de aloe.*)

The wood of the *Aquilaria agallocha*, otherwise called garrow wood. It has a fragrant odour when burned, somewhat resembling patchouli. It is obtained and most valued in Further India.

Lignite. (Fr. *Lignite*, Ger. *Braunkohlen*, Sp. *Berza roja.*)

The name applied to a mineral substance of vegetable origin, and sometimes called brown coal. It is considered to be wood in a state of fossilization, intermediate between peat and coal. A variety of lignite is jet. The mineral is not found in any great quantities in England, but there are deposits of great thickness in Germany. In the last named country it is burned as fuel, and it is likewise used as a source of paraffin oil, the oil being obtained by distillation.

Lignum Vitae. (Fr. *Bois de gaïac*, Ger. *Pockholz*, Sp. *Madera de gaiac.*)

The hard, heavy, close-grained wood of the *Guaiacum officinale*, a tree which grows extensively in the West Indies. It has a greenish colour, and is much used in the manufacture of blocks, pulleys, rollers in machinery, pestles, etc. From the tree is also obtained the Guaiac resin.

Lima Wood. (Fr. *Bois de Lima*, Ger. *Limaholz*, Sp. *Madera de Lima.*)

The dye wood used for the production of various tints of red, orange, and peach colour. It is obtained from the *Caesalpinia echinata*, a tree which is found in Brazil and Central America. Lima wood is also known as Pernambuco wood and Nicaragua wood.

Lime. (Fr. *Citron*, Ger. *Lime*, *Limone*, Sp. *Limon.*)

The fruit of the *Citrus limetta*, a tree which flourishes in the South of Europe, and in both the East and West Indies. There are many varieties of the fruit, and its uses are in the main the same as those of the lemon. Lime juice is extensively exported from Jamaica. Its value depends upon the presence of citric acid.

Lime. (Fr. *Tilleul*, Ger. *Linde*, Sp. *Tila*, *Tilo.*)

The popular name of the *tilia*, otherwise the linden tree. It grows in many parts of Europe, but especially in Germany and Russia. Its wood is light and soft, and much used for carving and turning. The charcoal obtained from burning the wood of the lime tree is considered to be the best for the manufacture of gunpowder. It is also much used medicinally, and for making tooth powders. By steeping the wood in water the fibrous portion of the bark can be separated and utilized for the manufacture of ropes, mats, and plaited work generally. (See *Bast.*) This business is mainly carried on in Russia. From the sap of the tree sugar may be evaporated.

Lime. (Fr. *Chaux*, Ger. *Calciumoxyd*, *Kalk*, Sp. *Cal.*)

The oxide of calcium, one of the alkaline earths. Its chemical symbol is C_aO, and its specific gravity 3·08. It is obtained by heating carbonate of lime or limestone, in a furnace or kiln. The carbonic acid is burned out and lime remains. This residue is commonly known as the quicklime of commerce. Lime is largely employed in the manufacture of mortar, and as a manure. Amongst its other uses are the purification of coal-gas, the preparation of hides for tanning, the manufacture of stearic acid for candle-making, and the smelting of various metals. The various compounds of lime are noticed under separate headings.

Limestone. (Fr. *Pierre calcaire*, *Pierre à chaux*, Ger. *Kalkstein*, *Flussspath*, Sp. *Castina.*)

The common name for a species of rock of a yellowish white colour composed mainly of carbonate of lime. It is very widely distributed, in fact lime stone rocks occur in every geological system. There are many different varieties, peculiar to certain formations. Compact limestone is hard, smooth, and fine-grained, and can be polished and made into ornaments. Crystalline limestone is another variety, sometimes known as statuary marble. Limestone is, however principally valuable as being the source from which lime is obtained.

Linen. (Fr. *Toile de lin*, Ger. *Leinwand*, *Leinen*, Sp. *Lienzo*, *Tela de lino.*)

The fabric manufactured from the fibres of flax and hemp. The industry is one of the most important of the United Kingdom, and finds its centres at Belfast in Ireland, Leeds in England, and Dundee in Scotland. Other large towns in the last named country engaged in linen manufacture are Arbroath, Kirkcaldy, and Dunfermline. The different linen textures extend over a wide range, and include fine lawns and cambrics, damasks, diapers, shirtings, as well as heavier fabrics, such as sail cloths and canvas. The exports from the United Kingdom are very large, and take the form of manufactured goods, linen yarn, thread, sail cloths, etc.

Ling. (Fr. *Morue*, Ger. *Klippfisch*, Sp. *Bacalão*, *Merluza.*)

A variety of cod fish, taken in large quantities off the British coasts. It is eaten both fresh and salted, and in the latter state is exported to southern Europe. From the liver of the ling an oil, similar to cod liver oil, is extracted. This oil is used as an illuminant in the Shetland Isles.

Linoleum. (Fr. *Linoléum*, Ger. *Linoleum, Korkteppich*, Sp. *Linoleum.*)

The name of a kind of floor cloth. It is made by incorporating ground cork with india-rubber, and rolling the mass into sheets and drying the same. It is easily stained for receiving patterns. It is waterproof and wears well, being also superior to ordinary oilcloth. An inferior kind of linoleum is made by combining linseed oil, sawdust, peat, chalk, pitch, and other substances, and treating the mixture in the same way.

Linseed. (Fr. *Graines de lin*, Ger. *Leinsamen*, Sp. *Linaza, Simiente del lino.*)

The seed of the flax plant, *Linum usitatissimum*, an important oil seed exported largely from India, the East Indies, and Russia. For the extraction of the oil the seeds are crushed and ground, and then subjected to enormous pressure. The oil, when quite pure, is colourless, but in commerce it is generally of an amber colour, and has a disagreeable odour and taste. It is much used in the manufacture of paints, varnishes, printing ink, oilcloths, etc., on acocunt of its drying qualities. The cake left after the expression of the oil is valuable as a cattle food. Linseed meal, which is composed of the flour of the ground flax seed or crushed oilcake, is useful for poultices on account of its powerful emollient properties. An infusion of linseed is employed in cases of colds and bronchial affections.

Lint. (Fr. *Charpie*, Ger. *Scharpie, Carpie*, Sp. *Hilas.*)

The soft woolly material used for surgical dressing and soaking up discharges. It was at one time made by scraping or tearing down old linen cloth or rags. Now, however, the lint used is specially prepared by machinery from a soft linen texture woven for the purpose, having one side soft and fluffy.

Liqueurs. (Fr. *Liqueurs*, Ger. *Liqueurs, Liköre*, Sp. *Licor.*)

The name for a variety of alcoholic preparations which are flavoured and sweetened. They differ widely in their composition and qualities. Chartreuse is made by a secret process and derives its name from the monastery where it was manufactured. There are two kinds—green and yellow. Benedictine is another well-known liqueur, made at Fécamp, which enters into competition with Chartreuse. Others which enter into British commerce are anisette, clove cordial, curaçoa, kirschwasser, kümmel, maraschino, noyau, and peppermint. Absinthe is not a liqueur, but belongs to the class of bitters and unsweetened spirits.

Liquidambar. (Fr. *Ambre liquide*, Ger. *Flüssiger amber*, Sp. *Liquidambar.*)

A genus of trees of the balsam order. Several species yield a resinous substance, when incisions are made in the bark, from which benzoic acid is obtained. From one species, found in the Levant, liquid storax is extracted. This substance is used for scenting tobacco, and driving moths from woollen clothing. The ordinary balsam is collected in the United States and Mexico, and is exported thence for commercial purposes.

Liquorice. (Fr. *Réglisse*, Ger. *Lakritze, Süssholz*, Sp. *Orozuz.*)

An herbaceous perennial, largely cultivated in the south of Europe, and valuable on account of its root, which contains a substance called *glycyrrhizine*, allied to sugar, soluble both in water and alcohol. The root is long, round, succulent, and flexible, and externally its colour is greyish-brown. Internally it is yellow. It is odourless and has a slight acid taste. Liquorice is used in the manufacture of sweet tobacco, and is also employed by brewers to give "body" to porter. In medicine it is considered of value in certain catarrhal affections. The roots of liquorice are imported in rolls or sticks, and the chief supplies are obtained from Spain and Turkey.

Litharge. (Fr. *Litharge*, Ger. *Bleiglätte, Silberglätte*, Sp. *Litargirie.*)

The fused minoxide of lead. It is known as massicit when pure, and enters into the composition of flint glass. It is also used by painters.

Lithium. (Fr., Ger., and Sp., *Lithium.*)

A rare metal, silver white in colour, which tarnishes quickly on exposure to the air. It is harder than sodium or potassium, but is softer than lead, and can be readily drawn into wire. It is the lightest known solid. When

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thrown upon water it oxidizes with great rapidity. The oxide of lithium, known as lithia, is valuable in the formation of a series of salts which are medicinally used as diuretics. The carbonate and citrate of lithia are used as solvents of uric acid, and are therefore most frequently prescribed in cases of rheumatism and gout. Lithium is found in combination with various minerals in Sweden.

Lithographic Stone. (Fr. *Pierre lithographique*, Ger. *Lithographierstein*, Sp. *Piedra litográfico.*)

The fine, hard, close grained stones used for taking impressions in lithographic work. They are generally prepared from thin slabs of a variety of limestone, or stones composed of lime clay, and siliceous earths. The grey-coloured stones are considered the best, and the principal supplies are derived from the quarries of Solenhofen, Bavaria. Stones of an inferior quality are obtained in Italy and France. The stones are cut and afterwards polished to prepare for use. Artificial stones, made of zinc, with thin coatings, have been recently substituted for the natural ones.

Litmus. (Fr. *Litmus*, Ger. *Lackmuss*, Sp. *Girasol.*)

A blue colouring or dyeing material obtained from various species of lichens, like archil, and cudbear. It differs, however, from them in being prepared with potash or soda, and in being moulded into cakes. It is turned red by the presence of acids, and consequently litmus is a valuable test in the chemical laboratory.

Lobsters. (Fr. *Ecrevisses de mer, Homards*, Ger. *Hummer, Seekrebse*, Sp. *Cabrajos.*)

The well-known crustaceans, found on the coasts of many European countries. The numbers taken in England and Wales amount to about one million a year. The largest supplies for European markets are obtained from Norway, the fish being shipped alive. There is an enormous business done in canning lobsters for the markets of the world in Nova Scotia, New Brunswick, and Newfoundland.

Logwood. (Fr. *Campêche*, Ger. *Kampeschenholz, Farbholz*, Sp. *Campeche.*)

The heart wood of the *Haematoxylum campechianum*, a tree of the West Indies, Central America, and the northern parts of South America. The wood is hard, close-grained, very durable, takes a high polish, and is heavier than water. The chief supplies are obtained from Jamaica and Honduras, whence the timber is exported in logs. The logs are cut into chips and ground for the use of dyers, and the colouring matter, or haematicin, for which the wood is valuable, is dissolved out by immersion in hot water. Extracts of logwood are made for dyeing purposes, especially silk and wool, and for calico printing. The best colours are deep brown and black, though other shades are obtainable by the use of suitable mordants. Logwood is also used in the manufacture of ink, both black and red. As a medicine it is sometimes given in cases of chronic diarrhœa.

Longan. (Fr., Ger., and Sp., *Longan.*)

The product of the *Nephelium longanum*, one of the most delicious and pleasing fruits of China and the Malay Archipelago. The fruit is of about the same size as the walnut, and is either red or green. It is largely used for making preserves, and in a dried state is exported from China to Great Britain.

Lucifer Matches.

(See *Matches.*)

Luminous Paint. (Fr. *Couleur lumineuse*, Ger. *Leuchtfarbe*, Sp. *Color luciente.*)

A powder such as sulphide or oxysulphide of calcium ground up with a colourless varnish or other similar substance and used as a paint. The object painted is visible in the dark.

Lunkah. (Fr., Ger., and Sp., *Lunkah.*)

The name of a kind of tobacco grown on the rich soils of Ceylon and on the banks of the Godavery. Owing to the presence of a large quantity of nicotine, this tobacco has a bad effect upon the nervous system, but it is milder than Trincinopoly.

Lycopodium. (Fr. *Lycopode*, Ger. *Lycopodium, Bärlapp*, Sp. *Pié de lobo.*)

A kind of vegetable sulphur, the spores of a fern *Lycopodium clavatum.* It is used for coating pills, for flash lights in firework displays, and for

theatrical imitation of lightning. A considerable quantity of this substance is annually exported from Russia.

Lynx. (Fr. *Lynx*, Ger. *Luchs*, Sp. *Lince.*)

The furs of the lynx are used for rugs, muffs, etc., and are easily dyed. Though the animal is fairly wide spread it is the Canadian species which supplies the furs of commerce. Between 30,000 and 40,000 skins are annually exported from Canada.

Macaroni. (Fr. *Macaroni*, Ger. *Macaroni, Fadennudeln*, Sp. *Macarron.*)

A preparation made from the ground meal of wheat when mixed into a stiff paste with water, and formed into slender pipes, like quills. When the apertures of the pipes are very small the substance is called vermicelli. The wheaten paste is also formed into cakes and fancy shapes, called Italian pastes. The drying of the various preparations is done either artificially or in the sun, the latter method giving the better result. Macaroni is quite a natural food in Italy, and besides the quantity required for home consumption there is a very large export trade in macaroni and vermicelli. The principal town of production is Genoa, though Cagliari in Sardinia has a wide reputation for the quality of its output. Recently the trade has spread to Marseilles and various other towns in the south of France.

Mace. (Fr. *Macis*, Ger. *Macis, Muskatblute*, Sp. *Macis.*)

The net-like inner covering of the nutmeg. When fresh it is of a scarlet colour, but when dried it becomes yellow and is so found in commerce. Mace is used as a cheap spice, and as a substitute for nutmegs. An oil of mace is extracted from certain small unsaleable nutmegs. The chief supplies of mace are obtained from Penang and Singapore.

Mackerel. (Fr. *Maquereau*, Ger. *Makrele*, Sp. *Sarda caballa.*)

The well-known fish, taken in great quantities every year off the coasts of the British Isles. The mackerel is generally eaten fresh, but the salted and smoked fish occasionally enter into commerce, though not to the same extent as other varieties. The North American mackerel is of a species totally distinct from the British fish.

Madder. (Fr. *Garance*, Ger. *Krapp, Färberwurzel*, Sp. *Rubia, Royuela.*)

The root of the *Rubia tinctorum*, a perennial shrub which grows in the South of Europe. From the root is extracted the colouring matter for dyeing Turkey red. This was, until a few years ago, the most important of all dye stuffs, and was largely used for dyeing cotton and ordinary woollen goods. The chief supplies are obtained from the Levant, Asia Minor, and France. Aniline dyes have almost entirely superseded all others, and the cultivation of the madder root is rapidly declining.

Madeira Wines. (Fr. *Vins de Madère*, Ger. *Madeirawein*e, Sp. *Vino de Madeira.*)

The name of various kinds of wine made in the Madeira Islands. Those most appreciated are Baal, Malmsey, Palhetinho, Sercial, and Tinto. Though naturally containing a large quantity of alcohol the wines sent to Great Britain have brandy added to them, and consequently are stronger in this country than on the continent. Good Madeira wines are improved by keeping, heat, and shaking, and on this account cargoes are frequently sent to the East Indies and brought back again, the East Indian Madeira being considered a special luxury.

Magnesia. (Fr. *Magnésie*, Ger. *Magnesia, Bittererde, Talkerde*, Sp. *Magnesia.*)

The only oxide of the metallic element magnesium. It is a fine white powder, obtained by the combustion of the metal, but often prepared by heating the carbonate. When calcined magnesia is mixed with water a compact mass is formed, much resembling plaster of Paris, and sometimes used as a substitute for that article. Carbonate of magnesia is an essential constituent of dolomite which forms the backbone of whole mountain chains. Citrate of magnesia is a medicinal compound of which the component parts are carbonate of magnesia, citric acid, syrup of lemons, bicarbonate of potash, and water. It acts as a mild aperient. The stronger aperient, Epsom salts, is the sulphate of magnesia.

Magnesium. (Fr. *Magnésium*, Ger. *Magnesium*, Sp. *Magnesio.*)

A metal usually grouped with the metals of the alkaline earths, but having many properties resembling those of zinc. It is obtained by fusing chloride of magnesium, one of the main constituents of sea-water, with sodium. It is brilliantly white and resembles silver in appearance. When drawn out into wire or ribbon it burns with a brilliant light, and is largely used for photography in dark places.

Mahaleb. (Fr., Ger., and Sp., *Mahaleb.*)

The *Cerasus Mahaleb*, a cherry tree cultivated extensively in the state of Baden. Its fruit yields a violet dye, and from the cherries much of the kirschwasser of Germany is prepared The wood of the tree is used for making walking sticks and pipe stems.

Mahogany. (Fr. *Acajou, Mahogon*, Ger. *Mahogoniholz*, Sp. *Caoba, Madera de anacardo.*)

A very valuable and beautiful timber, obtained from the *Swietenia Mahogani*, a tall and beautiful tree of the West Indies and Central America. The wood is of a close texture, reddish brown in colour, and takes a fine polish. It is also free from warping. The value of the wood varies according to its colour and markings. It is mainly used in the manufacture of furniture, though the bark of the tree has medicinal properties and is employed as a febrifuge, and the wood contains the astringent principle catechin, present in catechu. The largest supplies are obtained from Honduras, Campeachy, and the West India Islands generally. That of Honduras and Campeachy is known as bay wood, that of Cuba and Hayti as Spanish mahogany. The value of the exports is nearly £500,000 per annum. Another kind of mahogany is obtained from the East Indies, and this is valuable for making cabinets. The timber was formerly used for shipbuilding, but in recent years it has not been so employed except for ships' fittings.

Maize. (Fr. *Maïs, Blé de Turquie*, Ger. *Mais, Turkischerweizen*, Sp. *Maiz.*)

The well known cereal, the produce of the *Zea Mays*, a species of grass. It is very commonly known as Indian corn, and is one of the most important grain crops of the world, next in importance to rice. It is grown chiefly in the United States, but its cultivation is now very widespread. In Britain, however, it only thrives in favourable summers. The grains are arranged in compressed parallel rows along a central axis, the whole being called a cob. There are many varieties of maize, depending upon the climate, soil, and mode of cultivation. From the grass, sugar, treacle, and vinegar can be obtained. From the flour of the grain, corn-flour, maizena and Buego flour are prepared. The straw is used for making writing and printing paper.

Malacca Canes. (Fr. *Cannes de Malaca*, Ger. *Malaca-stöcke*, Sp. *Cañas de Malaca.*)

Walking sticks, obtained from a tree called *Calamus Scipionum*, which grows in Sumatra. The value of the canes varies according to the length of the spaces between the joints.

Malachite.)Fr. *Malachite*, Ger. *Malachit*, Sp. *Malaquita.*)

An ornamental green mineral, composed of carbonate of copper. It occurs most frequently amidst copper ores, and is found in the greatest abundance in Siberia. It is also obtained in Cornwall and in South Australia. It is capable of taking a fine polish and is employed for making ornaments and in inlaying work.

Malaga Wines. (Fr. *Vins de Malaga* Ger. *Malagawein*e, Sp. *Vino de Malaga.*)

The sweet rich wines obtained from Malaga, a Mediterranean seaport of Spain. There are several varieties exported, but generally they are divided into two classes, the red and the white, Ximenes, being considered the best of the former, and Lagrima the best of the latter.

Malaguetta Pepper.

(See *Grains of Paradise.*)

Malt. (Fr. *Drêche*, Ger. *Malz*, Sp. *Malta.*)

Barley or other grain prepared for the purpose of brewing beer. The best malt used is made from the finest barley. The grain is steeped in water for about two days and thoroughly saturated. It is then drained, and placed upon a floor in heaps. Germination commences and a rise in temperature takes place. The grain is then spread out in layers in a specially prepared malt-house, a building kept

dimly lighted and at a constant temperature of 60° Fah. The germination continues, and when it is sufficiently advanced the malt is dried in a kiln, the heat being carefully moderated. The whole process of making malt is one requiring great skill and judgment as well as incessant care. An extract of malt, called maltine, is used medicinally as a cure for scorbutic complaints.

Mandarin Oranges. (Fr. *Mandarines*, Ger. *Mandarinenorangen*, Sp. *Mandarines.*)

A variety of oranges, both large and small, grown in Sicily. One of the best known is the Tangerine. The fruit is most delicately flavoured, and the rind is exceedingly thin. There is a very large export trade from Palermo.

Manganese. (Fr. *Manganèse*, Ger. *Mangan*, Sp. *Manganeso.*)

A black, metallic ore, rarely found pure in nature, but widely spread in combination with other minerals. In its chemical and physical properties it somewhat resembles iron. It forms six compounds with oxygen, the peroxide, or black oxide of manganese, being the most common. Manganese is largely imported into this country, particularly from Sweden, for use in glass manufacture, for glazing black earthenware, and for giving colour to enamels. It occurs in many mineral waters, and is used to a certain extent in medicine. Permanganate of potash is the basis of Condy's Disinfectant Fluid.

Mango. (Fr. *Mangue*, Ger. *Mango, Muskatmelone*, Sp. *Mango.*)

The fruit of the *Mangifera Indica*, a tree which attains a considerable height in India. It is about the same size as a pear and shaped like a kidney. The mango is eaten as a fruit in India, and also in the West Indies, where the cultivation has been successfully introduced. If gathered before ripening an excellent pickle can be made, and it is chiefly as a pickle that the mango is known in Europe. A spirit is extracted from the juice of the fruit, and a gum is obtained from the stem and branches of the tree.

Mangold Wurzel. (Fr. *Betterave*, Ger. *Mangoldwurzel*, Sp. *Acelga.*)

Or Mangold, the general name used in Great Britain and America to describe the varieties of the field beet cultivated for feeding cattle. The method of cultivation is, in the main, the same as that of the turnip, but the mangold has an advantage over the turnip as it yields a much larger produce, is not affected by varying temperatures, and is not liable to be attacked by insects or disease. The mangold, as a field beet, is larger in all its parts, and coarser than the garden beet. It was not until 1786 that the mangold was cultivated in Great Britain, but its importance was quickly recognised, and the area under cultivation has continually increased.

Mangosteen. (Fr. *Mangouste*, Ger. *Mangostan*, Sp. *Mangouste.*)

The fruit of the *Garcinien Mangostana*, a tree found in most of the East India Islands. It is generally considered to be one of the most delicious fruits known. It is about the size of a small orange, white and juicy. The rind is tough and purple in colour, contains valuable tannin, and is used as an astringent in cases of dysentery and diarrhœa.

Mangrove Bark. (Fr. *Écorce de manglier*, Ger. *Mangelbaumrinde*, Sp. *Rodillo.*)

The bark of a large variety of trees, *Rhizophora*, which grow in marshy districts in South America. It is particularly rich in tannin and dye stuffs, and is exported from South America to Great Britain, France, and Germany.

Manilla Hemp. (Fr. *Chanvre de Manille*, Ger. *Manila-Hauf*, Sp. *Abaca.*)

The name used in commerce to describe the fibre of the wild plantains of the East Indies and the Philippine Islands.

Manillas.

The trade name for cigars and cheroots made in and exported from the Philippine Islands.

Manioc. (Fr. *Manioc*, Ger. *Maniok*, Sp. *Casabo, Yuca.*)

Also called Mandioc and Cassava. It is the name of a certain species of *Manihot*, a shrub extensively cultivated in tropical America, especially Brazil, on account of the roots. These roots are of immense size, black in colour, and contain a large amount of starchy matter. A milky juice pervades the whole plant and this acts

as a deadly poison owing to the presence of hydrocyanic acid. This juice is removed by washing, and the resulting substance forms an important article of food. The juice itself, when thickened by boiling, loses its poisonous qualities and is made into the sauce Casareep. From the starch of manioc, separated in the ordinary manner from the fibre of the shrub and known as Brazilian arrowroot, tapioca is made.

Manna. (Fr. *Manne*, Ger. *Manna*, Sp. *Maná.*)

A sweet exudation obtained from the bark of the Manna ash—*fraxinus ornus*. The tree was formerly cultivated very considerably in Calabria, but it is now mainly found in Sicily, and it is from Palermo that the manna of commerce is obtained. In order to obtain this substance the tree is cut and the manna oozes out. It hardens in lumps or flakes and is removed by the collectors. Manna is light and porous, yellowish in colour, and possesses a honey-like odour. It is used medicinally as a gentle purgative for children. Another species of manna is obtained in Arabia and Kurdistan from the leaves of the dwarf oak, Vamarisk, and other plants. Its use is entirely local, and it never enters into commerce.

Manure. (Fr. *Engrais*, Ger. *Dünger*, *Mist*, Sp. *Flemo*, *Estiércol.*)

The name for all substances which are used to maintain or increase the fertility of soils. The common farm yard manure has been supplemented by a number of natural and artificial manures, the principal of which are noticed under separate headings. The most common artificial manure is made from bones, of which more than 50,000 tons are imported every year. The natural manures include guano, superphosphates, sulphate of ammonia, nitrate of soda, potash salts, etc.

Maple. (Fr. *Érable*, Ger. *Ahorn*, Sp. *Arce.*)

A genus of trees growing in the temperate regions of the world, of which there are more than fifty species. The common maple has close grained, beautifully marked wood, capable of taking a high polish, and valuable for making cabinets. The wood of the sycamore maple is firm without being hard, and is much used by turners and musical instrument makers. The white maple of North America supplies a wood which is sometimes used for street planking. Other varieties are less valuable. From most kinds of maple sugar can be extracted, but this substance does not enter into commerce.

Maraschino. (Fr., Ger., and Sp., *Maraschino.*)

A delicate liqueur, distilled from the bruised fruit of the Marasca cherry, a tree cultivated in Dalmatia and some parts of Italy. After distillation the liqueur is, like other liqueurs, sweetened and flavoured with various cordials. The finest Maraschino is obtained from Zara. When imported, it comes in wickered bottles or flasks.

Marble. (Fr. *Marbre*, Ger. *Marmor*, Sp. *Mármol.*)

A rock composed principally of carbonate of lime, but the name is popularly given to any limestone which is sufficiently compact to admit of being polished. There are certain kinds of dark coloured marbles obtained in various parts of England, but the finest qualities, used in statuary and architecture, are obtained from different parts of the continent. The best is the white marble of Carrara, in Italy. This is employed almost exclusively for statuary and ornamental work. Coloured varieties of marble are obtained from various countries of Europe, France, Spain, Portugal, and Greece. Its use in architecture is extensive, as the stone is durable and specially suitable for building purposes. Among the best known marbles are the following:—Rosso antico, deep blood red in colour with white dots, obtained from Libya; Giallo antico, yellow with black rings, obtained from Milos; Brocatello, yellow with purple veins, from Simla; Portor, deep black veined with yellow, from Genoa; and Paragone, also fine black, from Bergamo. The name of marbling has been given to the art of applying various patterns to paper. It is much practised in Germany.

Margarine. (Fr. *Margarine*, Ger. *Margarin, Kinnstbutter*, Sp. *Margarine.*)

An artificial substitute for butter, often known as Oleomargarine, and also as butterine. It is chiefly

manufactured in and exported from Holland. (See *Butter.*)

Marjoram. (Fr. *Marjolaine*, Ger. *Majoran*, Sp. *Mejorana.*)

A genus of the plants of the order *habitae*, of which there are about twenty species. The common marjoram is a pot herb, and yields an essential oil which is valued by farriers as a stimulating liniment. The dry leaves and young tops are used for seasoning soups and for other culinary purposes.

Marking Ink.

(See *Ink.*)

Marmalade. (Fr. *Marmelade*, Ger. *Marmelade*, Sp. *Conserva de limones.*)

A preserve made by boiling the rind of oranges, quinces, etc., to syrup until it is soft, and afterwards reboiling the same, together with the juice of the fruit and a quantity of sugar equal in weight to that of the rind and juice combined. The process is continued until the whole has the consistence of jelly. The best kind of marmalade is made from bitter or Seville oranges. The largest factories are at Dundee, from which it is estimated that about three million pounds are sent out every year. Marmalade is also made on a considerable scale in London, Glasgow, and Paisley.

Marsala. (Fr. *Vin de Marsala*, Ger. *Marsala-wein*, Sp. *Vino de Marsala.*)

A Sicilian wine, so called from Marsala, the city whence it is exported. It resembles sherry and has been popular in England for more than a century. The wine is produced in very large quantities in Sicily, the chief customers being England and the West Indies.

Marten. (Fr. *Martre*, *Marte*, Ger. *Marder*, Sp. *Marta.*)

An animal belonging to the weasel family, dark brown in colour, and highly valued for its fur, which when well dressed is often substituted for sable. Nearly 100,000 skins are exported annually from North America.

Mastic. (Fr. *Mastic*, Ger. *Mastix*, *Harzkitt*, Sp. *Almaciga.*)

A gum resin obtained from the mastic tree, *Pistacia lentiscus*, which grows in the Greek Archipelago. The gum oozes from the tree when an incision is made in the bark, and hardens on the stem when exposed to the air. It is used in the manufacture of varnish for varnishing prints, maps, drawings, etc., the mastic being first dissolved in turpentine. Mastic is also used by dentists for stopping teeth.

Matches. (Fr. *Allumettes*, Ger. *Schwefelhölzchen*, *Streichholzchen*, *Zündhölzchen*, Sp. *Pajuelas.*)

The name formerly applied to various substances used for firing mines, etc., but now most generally signifying lucifer matches. The manufacture of matches is carried on at the present time exclusively by machinery. The wood employed is generally white pine, and this is cut into splints, each splint being long enough to make two matches. These splints are fixed by the middle in frames, and the ends are slightly charred and then dipped in paraffin. They are then ready for dipping in the necessary inflammable paste. The composition of this paste varies, as each manufacturer has his own secret process. It generally consists, however, of a combination of phosphorus, chlorate of potash or saltpetre, and red lead or black oxide of manganese, the whole being mixed with glue and some colouring matter. The paste is spread out on a warm hollow dish to the necessary thickness, and the splints are dipped in it and afterwards dried. They are then cut in two and the completed matches are packed in boxes. As a precaution against fire, safety matches have recently come into vogue. The paste in which the splints are dipped contains no phosphorus, but is a mixture of chlorate of potash, sulphide of antimony, and glue. Ignition is only possible by rubbing on the surface of the box which is coated with a composition of amorphous phosphorus, black oxide of manganese or sulphide of antimony, and glue. The most recent development in the match trade has taken place in Sweden and Norway, from which countries enormous quantities are annually exported. The centre of the trade is Jönköping. There are also a large number of factories in Austria and Germany, Vienna being at one time the principal manufacturing city in Europe. In France the manufacture of matches is a government monopoly, and in the United

States it is controlled by a combination. Besides the large number imported, it is estimated that the value of the matches made annually in Great Britain exceeds £1,500,000.

Maté. (Fr. *Maté*, Ger. *Matebaum*, Sp. *Maté, Te del Paraguay.*)

The leaves of the *Ilex Paraguayensis*, a shrub growing extensively in South America. In Brazil and other South American countries the leaves are used as a substitute for tea, and maté is often known as Paraguay tea. Its stimulating effect is derived from the presence of theine, the principle found in tea and coffee. Although it is a considerable article of commerce in Brazil and Paraquay, maté does not find a place in European commerce, in spite of the various efforts made to introduce its use into France.

Matico. (Fr. *Matico*, Ger. *Matico blätter*, Sp. *Matico.*)

The rough leaves of two plants, the *Artanthe elongata* and the *Eupatorium glutinosum*, natives of Peru, which are covered with a fine hair. They are valuable medicinally for their styptic properties, being used for stanching wounds.

Matting. (Fr. *Paillasson, Natte*, Ger. *Matten*, Sp. *Estera.*)

The principal substances used for the manufacture of mats are noticed under their separate headings.

Maw Seed. (Fr. *Graine de pavot*, Ger. *Mohnsame*, Sp. *Simiente de adormidera.*)

The seeds of a variety of the *Papaver somniferum*, possessing an ant-like flavour, imported from Russia as a food for cage-birds. In Poland the seeds are sometimes used as human food.

Mead. (Fr. *Hydromel*, Ger. *Honigwein*, Sp. *Aguamiel.*)

The fermented liquor made from honey and water. The honey used is that which remains in the combs after the main portion has been extracted. The liquor has a wine-like flavour, and has been a common beverage in northern Europe from the earliest times.

Meat Extracts. (Fr. *Extrait de viande*, Ger. *Fleischextract*, Sp. *Extracto de carne.*)

The concentrated essence of meat obtained by boiling down the carcases of oxen. A large number of these extracts are made in South America, and there are many well-known extracts made in Europe by peculiar processes, which are the secrets of their manufacturers. The trade in these substances is rapidly increasing.

Medlar. (Fr. *Nèfle*, Ger. *Mispel*, Sp. *Nispera.*)

The fruit of a species of apple tree, widely cultivated in southern Europe, and western Africa. The common medlar is found in parts of England. The fruit is about the size of a small apple, pulpy and sweet. The golden yellow variety is most prized and is used for making jellies and preserves.

Medoc. (Fr., Ger., and Sp., *Medoc.*)

The wine of some of the most prized clarets of the Gironde, shipped from Bordeaux. The principal of these are Château Maryaux, Château Lafite, and Château Latour.

Meerschaum. (Fr. *Écume de mer*, Ger. *Meerschaum*, Sp. *Espuma de mar.*)

Also called Sepiolite. It is a fine-grained, soft, compact mineral, generally white in colour, though sometimes possessing a yellowish or pinkish tinge. It is a hydrated silicate of magnesium, and its composition is silica 60·9 parts, magnesium 26·1, and water 13. Meerschaum occurs in beds in Asia Minor, Greece, Morocco, and Spain. When freshly dug, it is quite soft, absorbs grease, and makes a lather. For this reason it is often used as a soap in Turkey. In Spain it is sometimes employed for building. But the greater portion obtained is made into pipes, in the manufacture of which Vienna has long held the most prominent position, drawing its chief supplies from Smyrna. Fancy meerschaum pipes are also made in France. Owing to the large demand, much artificial meerschaum is now in the market.

Melon. (Fr. *Melon*, Ger. *Melone*, Sp. *Melon.*)

The fruit of the *cucumis melo*, a species of cucumber plant, widely cultivated in the south of Europe. There are many varieties, the principal, however, being the musk melon and the water melon, and the latter is the fruit most valued. The colour of the flesh of the fruit is white, green, salmon-coloured, red, etc. The melon is juicy and watery, and is mostly eaten in

warm climates. The principal British supplies are obtained from Malaga, in Spain, and from various parts of Portugal.

Melton.

A kind of broadcloch. It has a soft and pliable finish, but is manufactured without any gloss.

Menhaden.

A fish of the herring family, taken in large quantities off the eastern shores of the United States. Its flesh is not used for food, but the fish itself makes excellent manure and yields an oil which is employed in leather dressing, in the manufacture of rope, and in mixing colours.

Menthol. (Fr. *Menthole*, Ger. *Menthol*, Sp. *Menthol.*)

A kind of camphor obtained from oil of peppermint by cooling. It is, however, generally prepared from the *Mentha arvensis purpurescens*, which is more productive of menthol than peppermint. It is made into the form of cones or pencils and is a household remedy in various nervous complaints, such as headache, neuralgia, toothache, etc. Its effectiveness is caused by the rapid evaporation of the menthol after rubbing the part affected. It is sometimes prescribed in cases of diphtheria.

Mercury. (Fr. *Mercure*, Ger. *Mercur, Quecksilber*, Sp. *Azogue, Mercurio*)

The chemical name for quicksilver. It is the only metal liquid at ordinary temperatures. It is rarely found native, and practically the whole of the mercury of commerce is obtained from its only important ore, sulphide of mercury, or cinnabar. Formerly the principal source of supply was Almaden in Spain, and certain districts in Italy and Austria, but now California has the leading place in the export of the ore. Cinnabar is a crystalline mineral of a bright red colour, and when roasted the sulphur burns away, the mercury being left behind as vapour which is condensed. When pure, mercury is of a silvery brightness, which is unaltered by exposure to the air. It boils at 675° Fah., and freezes at -40° Fah. Its specific gravity is 13·6. Its uses in the laboratory and in the arts are very numerous. Owing to its affinity for other metals it is extensively used in separating such metals as gold and silver from their ores. One of its amalgams, with tin, is used for silvering glass mirrors, and another, with copper or cadmium, is employed in dentistry for stopping teeth. It is also valuable in the construction of barometers, thermometers, and other philosophical instruments. Mercury is largely used in medicine, especially is the form of ointments and plasters. It is also the source of the pigment vermilion. Chloride of mercury is a valuable agent for the preservation of anatomical specimens.

Merino. (*Mérinos*, Ger. *Merinoschaf*, Sp. *Merino.*)

The name of a choice breed of Spanish sheep, celebrated for their long fine wool. The merino has, however, been introduced into Australia and South America, which now produce the chief supplies of wool.

Methylated Spirit. (Fr. *Esprit pyroxylique*, Ger. *Methylalkohol*, Sp. *Alcohol metilico.*)

A mixture of strong alcohol with about ten per cent. of impure wood naphtha or methylic alcohol. The addition of the wood naphtha, which has a disagreeable odour and taste, renders the liquid unfit for drinking, though it does not interfere with its application in many processes in arts and manufactures. It is largely employed as a solvent in the preparation of varnish, and it is useful for the preservation of specimens in museums.

Mica. (Fr. *Mica*, Ger. *Marienglas, Glimmer*, Sp. *Espejuelo.*)

The name of several minerals, made up of silica, alumina, magnesia, and potash, together with small quantities of lime, the oxides of iron and manganese and soda. Ordinary mica, also called muscovite, occurs in thin plates of varying sizes in different parts of the globe. It is found in Cornwall, in Sweden and Norway, and in Siberia. The plates are generally transparent, and consequently mica is sometimes used instead of glass for lanterns, and also for the fronts of stoves, as it is not liable to crack through sudden changes of temperature.

Milk. (Fr. *Lait*, Ger. *Milch*, Sp. *Leche.*)

The opaque white fluid secretion with which animals sustain their young. The milk which enters into commerce is the product of the cow.

Besides its daily use as a beverage and for innumerable domestic purposes, it is in vast demand for the manufacture of butter and cheese. As milk in its ordinary state quickly becomes sour, a large trade in condensed milk has grown up within very recent times. It is prepared from the milk of the cow sweetened with cane sugar. The whole is then boiled until about five sixths of the sweetened milk has evaporated, and the residue is poured into tins while it is hot and the tins are hermetically sealed. Switzerland takes a prominent place in the manufacture and exportation of condensed milk. Much, however, is made in Holland, France, and North America.

Millboards. (Fr. *Cartons*, Ger. *Pappdeckel, dicke Pappen*, Sp. *Cartons.*)

Strong flexible boards, so called because they are milled under heavy rollers to give them solidity and a smooth surface. They are manufactured out of the waste of various substances—old sacks, old rope, straw, jute, cardboard, etc., which are reduced to a pulp, though not treated so carefully as when paper is made. The whole process is done by machinery. Millboards are of various thicknesses, and are used for binding books, making trunks, and various miscellaneous purposes. They were formerly employed for joining flanged pipes and for other engineering work, but their place has been taken by asbestos.

Millet. (Fr. *Millet*, Ger. *Hirse*, Sp. *Mijo.*)

The small grained seed of various cereals, the principal of which are the *Panicum* and *Setaria*. These are natives of the East Indies, but the common millet, *Panicum miliaceum*, is now extensively cultivated in southern Europe and the warmer parts of Africa and America. The grain is exceedingly nutritious, and is used as a foodstuff in various countries. In England, however, the seeds are only employed as a food for poultry and cage birds, the small supplies required for consumption being imported mainly from Italy.

Millinery. (Fr. *Modes, Parures de femme*, Ger. *Modewaren*, Sp. *Articulos de moda.*)

Light articles of dress, worn mainly by women and children.

Millstones. (Fr. *Pierres meulières*, Ger. *Mühlsteine*, Sp. *Piedras de molino.*)

Circular rollers manufactured from buhr stones, a hard silicate. The best stone is obtained from the valley of the Seine. The use of millstones has been almost entirely superseded by the introduction of iron rollers.

Mimosa Bark. (Fr. *Ecorce d'acacia*, Ger. *Akazienrinde*, Sp. *Corteza de acacia.*)

The bark of different species of acacia, found in Africa, Asia, and Australia. The Australian mimosa is the best known, and is commercially useful for the tannin contained in the bark. The tree itself yields gum in very large quantities. The exports of the bark from Adelaide have increased very rapidly during the last twenty years.

Mineral Oils.

(See *Naphtha, Paraffin, Petroleum.*)

Mineral Waters. (Fr. *Eaux minérales*, Ger. *Mineral-wasser*, Sp. *Agua mineral.*)

The natural waters supplied by various springs in different parts of the world. Some of these are bottled and exported from the countries in which they are found. The name is also given to the numerous artificially prepared aerated waters and effervescing drinks, such as soda water, seltzer, potash, lithia water, lemonade, ginger-beer, ginger ale, etc. These are manufactured by impregnating the water used with an excess of carbonic acid gas or other gaseous substances.

Minium. (Fr. *Minium*, Ger. *Mennige*, Sp. *Minio.*)

The commercial name for red oxide of lead. The oxide is chiefly found in Germany, and our supplies are entirely derived from that country.

Mink. (Fr. *Loutre*, Ger. *Mink, Nörz*, Sp. *Mink.*)

A small carnivorous animal, a species of weasel, valuable on account of its fur. It is found in the northern parts of America, Europe, and Asia. The best furs are obtained from North America, and of these about 100,000 are exported every year. The skin of the Russian mink is smaller than that of the American, and much inferior in quality. The fur is used for cloaks, muffs, and other articles of ladies' attire.

Mint. (Fr. *Menthe*, Ger. *Krausemünze*, Sp. *Menta crespa.*)

The well-known genus of useful herbs, of which there are many varieties. The most important species are Spearmint, Peppermint, and Pennyroyal. The first of these is the herb chiefly used for culinary purposes, and has a very agreeable odour. Peppermint resembles spearmint in appearance, but has a pungent odour and taste peculiar to itself. From it an essential aromatic oil is obtained which is of considerable medical value in gastric complaints. The oil is also used for flavouring lozenges. Pennyroyal also contains an essential oil, which is used when a milder remedy than peppermint is required.

Mirbane. (Fr., Ger., and Sp., *Mirbane.*)

An artificial oil of almonds. It is a yellowish liquid, and is often prepared by treating benzole, a bye product of petroleum, with nitric acid. The product is used in immense quantities in the manufacture of soap.

Mohair. (Fr. *Poil de chèvre*, Ger. *Haartuch*, Sp. *Tamiz, Cilicio.*)

The commercial name for the long, soft, curly hair of the Angora and other Eastern goats, animals once peculiar to Asia Minor, but now acclimatized in Australia, South Africa, and California. Mohair is white in colour and silky in lustre. Imported into England mainly from Australia and South Africa, it is spun at Bradford and other towns of the West Riding of Yorkshire.

Mohira Flowers.

The flowers of the *Bassia latifolia*, an Indian plant. The flowers contain much sugar, and are used as a food and also distilled into spirit. Considerable quantities of the dried flowers have been recently imported into Europe for the use of distillers.

Moire. (Fr. *Moiré*, Ger. *Gewässerter Seidenstoff*, Sp. *Materia de seda.*)

A term applied to silks figured by a peculiar process known as watering. The silk, which must be carefully selected, is well damped and carefully folded, so that the threads of the fabric all lie in the same direction, and do not cross each other, except in the ordinary way of the web and the warp. The folded material is then subjected to enormous pressure. By means of this pressure the air is expelled and the moisture is drawn in waved lines. These lines leave the permanent marks known as waterings. The watered portions reflect the light and are then displayed to advantage. The best kinds of moire are known as "moiré antique," as resembling the silks worn in olden times.

Molasses. (Fr. *Mélasse*, Gr. *Melasse*, Sp. *Melaza.*)

The sweet syrup which drains from raw sugar, used for making rum. (See *Sugar.*)

Mora. (Fr., Ger., and Sp., *Mora.*)

The valuable timber obtained from the gigantic *mora excelsa*, a tree of British Guiana and Trinidad. The timber is hard and close-grained, and specially adapted for ship-building, for which purpose it is largely exported from Demarara. The bark is astringent and very suitable for tanning.

Morocco Leather. (Fr. *Maroquin*, Ger. *Maroquin, Maroquinleder, Saffian*, Sp. *Marroqui, Tafilete.*)

The leather of goat skins tanned with sumach, dyed, and grained. Originally made in North Africa it is now imitated in Europe, and made from sheep skins.

Morphia. (Fr. *Morphine*, Ger, *Reines Morphin*, Sp. *Morfina.*)

Also called morphine. It is the most important alkaloid of opium, and is obtained from opium by means of calcium chloride and ammonia. It forms small white crystals which are slightly soluble in water. The chemical symbol for morphia is C_{17} H_{19} NO_3 H_2 O. The chief features of this alkaloid are its bitter taste, its alkaline reaction, and its narcotic poisonous properties. In medicine it is used as an anodyne, and is prescribed to be taken internally, or by hyperdermic injection. The hydrochlorate of morphia is occasionally used in the manufacture of cough lozenges.

Mosaic Gold. (Fr. *Or Mosaïque*, Ger. *Musivgold*, Sp. *Oro de mosáico.*)

An alloy of copper and zinc.

Moselle. (Fr. *Vin de Moselle*, Ger. *Moselwein*, Sp. *Vino de Mosela.*)

The wine made from the grapes grown in the valley of the Moselle, an affluent of the Rhine. It is prepared either still or sparkling. The still wine

in its natural state is mild, but a flavour is added to it by the admixture of a tincture of elder flowers. The sparkling wine, which is made chiefly at Coblenz, is also flavoured in a similar manner. The tincture not only gives a flavour, but adds to the alcoholic properties of the wine.

Mother of Pearl. (Fr. *Nacre de perle*, Ger. *Perlenmutter*, Sp. *Nácar.*)

The brilliant internal layer of certain shells belonging to the oyster family. Various kinds are obtained from the Philippine Islands, the Sandwich Islands, Singapore, and Western Australia. This substance is used for inlaying and for the manufacture of knife handles, studs, buttons, and other ornamental articles.

Mouldings. (Fr. *Moulures, Panneaux*, Ger. *Simswerke*, Sp. *Molduras.*)

The carved and plane borders or edges for doors, panels, picture frames, etc. The commoner kinds of mouldings are extensively made in Sweden, and exported thence to the various countries of Europe.

Mudar Bark. (Fr. *Ecorce de mudar*, Ger. *Mudarrinde*, Sp. *Corteza de mudar.*)

The inner bark of the *Calotropis gigantea*, an Indian shrub. The bark yields a valuable fibre which is equal to hemp in its strength, and the shrub supplies a milky juice which hardens into a substance resembling gutta percha. Its powdered bark is used medicinally as a substitute for ipecacuanha in cases of dysentery.

Mulberry. (Fr. *Mûre*, Ger. *Maulbeere*, Sp. *Mora.*)

The fruit of the *morus alba* and *morus nigra*, eaten in India both fresh and dried. The leaves of the mulberry tree form the main food of silkworms. Another species of the tree is the Paper Mulberry of China and Japan, from the best of which a textile fabric and paper are made.

Mum. (Fr., Ger., and Sp., *Mumme.*)

A peculiar kind of beer made from wheat meal. Some brewers add bean meal and oatmeal to the wheat meal. Though once brewed in England it is now made exclusively in Germany. The imports of mum from Germany into England are not very considerable, averaging about 2,000 barrels per annum.

Mundic.

The name given in Cornwall to iron pyrites, a compound of iron and sulphur.

Mungo.

The waste produced in a woollen mill from hard spun or felted cloth, or from tearing up old clothes, and used for the manufacture of cheap cloth or shoddy. (See *Shoddy.*)

Muntz's Metal. (Fr. *Metal de Muntz*, Ger. *Münzmetall*, Sp. *Metal de Muntz.*)

An alloy of copper and zinc, largely used for sheathing ships' bottoms. The compound is cheaper than copper and equally serviceable for this particular purpose. England exports considerable quantities of this metal.

Muscatels. (Fr. *Raisins muscats, Vins muscats*, Ger. *Muskatltrauben, Muskatwein*, Sp. *Moscatel, Vino Moscatel.*)

A variety of white and black grapes, extensively grown in the vineyards of France, Italy, and Spain. The dried grapes are exported as raisins for dessert use. The name is also given to certain strong sweet French and Italian wines which are made from the grapes. In the manufacture of these wines the grapes are allowed to dry before the syrupy juice is extracted from them. Amongst the best known of the French wines are the white Rivesaltes and the red Bagnol from Roussillon, and the yellow Frontignan, so called from the town of the same name, situated near Cette, on the Mediterranean. Of the Italian wines the Lacrymæ Christi of Naples is the most celebrated.

Mushrooms. (Fr. *Champignons*, Ger. *Erdschwämme, Pilze, Trüffeln*, Sp. *Criadillas.*)

Edible fungi, a species of *Agaricus.* They are valuable as a food delicacy.

Musk. (Fr. *Musc*, Ger. *Moschus*, Sp. *Almizcla.*)

A strong perfume obtained from the powder secreted in a pouch of the abdomen of the male musk deer. The musk pouch is cut from the animal immediately after it is killed. The powder is largely imported into England from India and China, and is used by perfumers. Artificial musk is also obtained as a coal-tar product and is manufactured in Germany.

Muslin. (Fr. *Mousseline*, Ger. *Musselin*, Sp. *Muselina.*)

A fine cotton fabric, deriving its name from Mosel, in Mesopotomia, where it was first made. Some of the finest muslins are made in India, but Manchester and the surrounding district supply various kinds of muslin for all parts of the world. Figured muslins of a special quality are made at St. Quentin, in France.

Musquash. (Fr. *Rat à musc*, Ger. *Bisamratte*, Sp. *Raton almizclado de las Antillas.*)

A fur-bearing animal of North America—the *Fiber zibethicas.* The skins of this animal are black or brown, and are exported, though in declining numbers from North America to England and other European countries. The fur is made into muffs, capes, caps, etc., and is used as a good imitation of beaver fur.

Mussels. (Fr. *Moules*, Ger. *Muscheln*, Sp. *Marisco.*)

A mollusc or shell-fish taken off the coasts of Great Britain, France, Holland, and the Atlantic seaboard of the United States. In England and France mussels are used as food and in Scotland as a bait. To a certain extent they are also used as a manure in England and the United States. Large supplies are sent annually from Holland to England to meet the increasing demand.

Mustard. (Fr. *Moutarde*, Ger. *Senf*, Sp. *Mostaza.*)

The name of several species of the plant *sinapis*, though there are three only which contribute their seeds to the manufacture of mustard—the black, the white, and the wild. The first has deep brown seeds, and the seeds of the second are yellow. The condiment is made from these seeds. The black is used on the continent, and is the most pungent. In England the white is preferred, and the great bulk of that which is required is grown in the Eastern Counties. There are, however, considerable imports from India. The pungent properties of mustard are due to an acrid volatile oil, the action of which is similar to the action of oil of bitter almonds.

Myall Wood. (Fr. *Bois d'acacia*, Ger. *Akaziaholz*, Sp. *Medera de acacia.*)

The fragrant violet scented wood of several species of acacia which grow in Australia. The wood is valuable for the manufacture of pipes and whip handles.

Myrobalans. (Fr. *Myrobolans*, Ger. *Myrobalanen*, Sp. *Myrobolans.*)

The fruit of the *Terminalia chebula* and the *Terminalia belerica*, natives of India. The fruit resembles a nutmeg, and from it is extracted an oil which is used as a hair restorer. The ground nut is also employed in calico printing, tanning, and the manufacture of ink.

Myrrh. (Fr. *Myrrhe*, Ger. *Mirrhe*, Sp. *Mirra.*)

The gum-resin obtained from the *Balsamodendron myrrha*, a tree growing in Arabia and Abyssinia. The resin exudes from the bark as light-coloured drops. When exposed to the air the drops harden and change in colour to dark brown. It is composed of resin, gum, and an essential oil with a small quantity of mineral matter. It has a smell resembling that of balsam, and its taste is bitter. From the earliest times myrrh has been used for burning as incense, and it is still used for religious purposes. Medicinally it is now employed as a stimulating tonic, and as an ingredient in the manufacture of dentifrices.

Myrtle Wax. (Fr. *Cire de myrte*, Ger. *Myrtenwachs*, Sp. *Cera de mirto.*)

A vegetable wax obtained from the *Myrica cerifera* by boiling the berries of the tree. The wax is one of the commercial products of South Africa and the western States of America. It is used for the manufacture of candles.

Nails. (Fr. *Clous*, Ger. *Nägel*, Sp. *Clavos.*)

Small metal spikes used as fasteners by carpenters, joiners, and others. They are now manufactured almost entirely by machinery, and are made of various metals. The centres of the industry in England are Birmingham and Dudley, and the nails made, in addition to fulfilling the requirements of domestic consumption, are exported to India and the Colonies.

Nankeen. (Fr., Ger., and Sp., *Nankin.*)

A cotton cloth made of buff coloured or yellow calico, formerly exported by China, but now manufactured in

Europe. The colour is produced artificially by dyeing white calico with a tanning solution.

Naphtha. (Fr. *Naphte*, Ger. *Naphtha, Steinöl, Erdöl*, Sp. *Nafta.*)

The name once applied very widely to liquid hydrocarbons exuding from the ground, but now signifying the inflammable distillates of crude mineral oils and coal-tar. Paraffin and petroleum are not now included in the list. But the term does include the distillates of india-rubber, bones, wood, peat, etc. The forms of naphtha are very different in their chemical construction, but all are highly inflammable and exceedingly volatile. Their uses in the arts are also widely different, but it is mainly as solvents that they are of commercial importance. The use of one kind of naphtha, viz. benzoline, for small lamps has disappeared owing to the cheap production of paraffin.

Natron. (Fr. *Natron, Soude naturelle*, Ger. *Natron, Natürliche Soda*, Sp. *Natron.*)

The native sesquicarbonate of soda obtained from the lakes of Egypt and from the borders of the Caspian Sea. It always contains sulphate of soda and chloride of sodium. Supplies of natron, which is also known as trona, are also obtained from Virginia and Venezuela.

Naples Yellow.

This is the name of a valuable pigment, yellow in colour, which is much used in oil painting and enamel painting. It is likewise employed for enamel colouring. The basis of the pigment is antimony. It is a good substitute for chrome yellow.

Neat's Foot Oil. (Fr. *Huile de pattes de bœuf*, Ger. *Klauenfett, Knochenöl*, Sp. *Oleo de hueso.*)

An oil obtained by boiling down the split feet of oxen, or by treating the feet with superheated steam in a closed cylinder. This product is exported very largely from South America, and it is used to a considerable extent for softening and dressing leather.

Needles. (Fr. *Aiguilles*, Ger. *Nadeln*, Sp. *Agujas.*)

These well-known steel articles are now made exclusively by machinery. The centre of the manufacture in England is at Redditch, near Birmingham.

Nephrite. (Fr. *Néphrite*, Ger. *Nephrit, Nierenstein*, Sp. *Nefritica.*)

A mineral found in Turkestan and Siberia. It consists of an anhydrous silicate of lime and magnesia, and is very hard, tough, and translucent. It varies in colour from dark green to milky white. In China and Japan nephrite is highly valued for ornamental purposes, and elaborate vases are carved out of it. Quite recently the mineral has been found in British Columbia and New Zealand.

Neroli Oil. (Fr. *Huile de néroli*, Ger. *Pomeranzenblütenöl*, Sp. *Esencia de azahar.*)

The commercial name for the fragrant volatile oil obtained from orange flowers by distillation. It is one of the principal ingredients in the manufacture of Eau de Cologne and other perfumes.

New Zealand Hemp. (Fr. *Chanvre de la Nouvelle Zélande*, Ger. *New-Seeland-hanf*, Sp. *Cañamo de New Zealand.*)

The fibre obtained from the *Phormium tenax*, the hemp plant of New Zealand. It has recently become an article of importance in commerce owing to the advancing prices of Manilla hemp. It is used for rope-making in England and to some extent in France.

Nicaragua Wood. (Fr. *Bois de Nicaragua*, Ger. *Nikaraguaholz*, Sp. *Madera de Nicaragua.*)

The product of the *Caesalpinia echinata*, a tree of Central America and the tropical parts of South America. It is used as a red and black dye. The best wood is obtained from Peru. It is also known as Peachwood.

Nickel. (Fr. *Nickel*, Ger. *Nickel*, Sp. *Niquel.*)

A greyish white metal which was at one time chiefly prized as being a valuable alloy, but is now used independently for many industrial and domestic purposes. It is not found native, and its most important ore is *Kupper-nickel* (false copper), a metal with a copper-like appearance, and composed of nickel and arsenic. This ore is fairly abundant in Germany, Hungary, France, and the United States. In the smelting of the arsenical ore a product called "speiss" is first obtained, and from this the

ordinary metal is extracted. The principal compound for which nickel is used is German silver, composed of 50 parts of copper, 30 of zinc, and 20 of nickel. This substance is in great demand for making the base of silver plated goods. Some of the salts are used medicinally. Sulphate of nickel is prescribed in cases of severe headache.

Nitre. (Fr. *Nitre*, Ger. *Salpeter*, Sp. *Nitro, Salitre.*)

Also commonly known as nitrate of potash and saltpetre. Its chemical symbol is KNO_3. Nitre is a white salt occurring either in the form of prismatic crystals or as a crystalline powder. It is found naturally as an incrustation on the surface of the soil of tropical countries, especially in Bengal and Oude; and it is prepared artificially by the action of nitric acid upon potash. In France nitre is prepared from animal refuse—hides, entrails, etc. The animal matter, mixed with lime rubbish and ashes, is exposed to the air and kept moist with stable drainage. The greater portion, however, of the nitre of commerce is made from Chilian nitrate of soda by double decomposition. Nitre has a cooling saline taste, and dissolves readily in water. It contains a large proportion of oxygen and burns very readily and rapidly. It is a very important ingredient in the manufacture of gunpowder, fireworks, etc. It is also used in the preparation of sulphuric and nitric acids. Medicinally it is employed for numerous purposes, especially in cases of rheumatism and sore throat.

Cubic nitre, or nitrate of soda, is sometimes known as Chili saltpetre. Its chemical symbol is $NaNO_3$. It occurs as an incrustation of the soil in Bolivia, Peru, and Chili, and derives its name from the cube-like form of its crystals. It is a white salt-like nitre, and the properties of the two substances are much the same. But cubic nitre is unsuitable for the manufacture of gunpowder. It is, however, of great value as a manure.

Nitre, Sweet. (Fr. *Alcool nitrique éthéré*, Ger. *Salpetergeist*, Sp. *Espiritu de nitro.*)

A liquid having a smell of ether and a sharp taste, prepared by distilling alcohol with a mixture of nitric and sulphuric acid and metallic copper. In reality it is a liquid composed of alcohol and nitrate of ethyl. It is a remedy often administered in cases of colds, etc., when it is desired to produce or promote perspiration. Its chemical symbol is $C_2H_5NO_2$.

Nitric Acid. (Fr. *Eau forte*, Ger. *Salpetersäure*, Sp. *Acido nitrico.*)

A colourless liquid when pure, but commercially a yellowish liquid, highly corrosive, much used in the arts and prepared by distilling nitrate of sodium with sulphuric acid. Its chemical symbol is HNO_3. It is a powerful oxidizing agent and attacks nearly all organic substances. It dissolves many metals, and a mixture of hydrochloric acid and nitric acid, known as aqua regia, will dissolve gold and platinum. The uses of nitric acid, both in chemical processes and in the arts, are exceedingly numerous, and medicinally it is prescribed in a diluted form in conjunction with bitter infusions for cases of biliousness.

Nitro-Glycerine. (Fr. *Nitro-glycérine*, Ger. *Nitro-glycerin*, Sp. *Nitro-glycerine.*)

The oily liquid prepared by dissolving glycerine in equal parts of strong nitric and sulphuric acids. The solution is poured into water and the nitro-glycerine is precipitated. It is a violent explosive compound, and detonates when struck by a hammers When slowly heated it decompose. quietly and burns without any explosion. The danger connected with the storage and conveyance of nitro-glycerine caused its use to be checked until the discovery of dynamite and gun cotton. (See *Dynamite, Gun-cotton.*)

Nitrous Ether.

(See *Nitre, Sweet.*)

Nut-galls. (See *Galls.*)

Noyau. (Fr. *Crême de noyau*, Ger. *Nuss-liqueur*, Sp. *Noyau.*)

Also called Crême de noyau. It is a favourite liqueur of which there are several varieties. It owes its characteristic flavour to the presence of a small proportion of the essential oil of bitter almonds, or to the oil derived from the kernel of the apricot and the peach. Flavouring ingredients are also added, and as in the case

of other liqueurs the whole preparation is sweetened with fine sugar.

Nutmeg. (Fr. *Noix muscade*, Ger. *Muskate*, Sp. *Nuez moscada.*)

The albuminous kernel of the seed of the *Myristica officinalis*, a tree of the Dutch East Indies. For many years the Dutch had a monopoly of the supply of nutmegs, and at the present day the largest exports are from Java and other Dutch Colonies. Nutmegs vary much in size and shape, the most valuable being those which are round and about one ounce in weight. They have a narcotic aroma and are used as a spice and also as a stimulating medicine. From the nutmeg kernel mace is obtained, and from the nutmeg itself a solid oil is expressed.

Nutria Skins. (Fr. *Peaux de nutria*, Ger. *Nutriafelle*, Sp. *Piel de nutria.*)

The name of the skins obtained from a South American rodent, commonly called the Coypu rat. Immense numbers are imported annually from the Argentine Republic. The fur, when unhaired, is a cheap substitute for the skin of the beaver.

Nuts. (Fr. *Noisettes*, Ger. *Nüsse*, Sp. *Nuez.*)

The principal nuts of commerce are noticed under separate headings.

Nux Vomica. (Fr. *Noix vomique*, Ger. *Brechnues*, Sp. *Nuez vómica.*)

The seeds of the *Strychnos nux vomica*, a straggling tree of India, Cochin China, and the East Indies. The fruit of the tree is a large berry, much like a small orange, and in it the seeds are laid flat. Their taste is exceedingly bitter, and from them the two alkaloids strychnine and brucine are obtained. The seeds are mainly exported from India, and their only value is for the extraction of the alkaloids which are used in medicine.

Oak. (Fr. *Chêne*, Ger. *Eiche*, Sp. *Encina.*)

The timber of several species of *Quercus*. There are between 250 and 300 species of this tree growing widely within the tropics and the temperate zone. In England the principal of these is the common oak. The timber is remarkable for its strength and durability, and as it is impervious to water it is admirably adapted for shipbuilding. Large supplies are now obtained from foreign countries especially America, where the tree in greatest esteem is the white oak. The bark is admirably adapted for tanning purposes, and is the principal substance used by curriers in Great Britain. Oak bark is also used medicinally as an astringent. To supply the English requirements large quantities of bark are imported from Belgium.

Oakum. (Fr. *Etoupe*, Ger. *Werg*, Sp. *Estopa.*)

A waste substance made from old rope by untwisting the strands and rubbing the fibres free from each other. It is principally used for caulking the seams of ships. The tearing of oakum is one of the main occupations of prisoners undergoing hard labour.

Oatmeal. (Fr. *Gruau d'avoine, Farine d'avoine*, Ger. *Hafermehl, Hafergrütze*, Sp. *Harina de avena.*)

The flour obtained by grinding oats. For the preparation of this substance the oats are first kiln-dried. By the process of milling the husks of the grain are removed, and it is the subsequent grinding which leaves the whole in the state in which oatmeal is found as an article of commerce. Oatmeal made into porridge or baked into cakes was once the staple food of the Scotch. It is highly nutritious, and contains greater proportions of albuminoid or nitrogenous matter than wheaten flour, but less starch and water.

Oats. (Fr. *Avoines*, Ger. *Hafer*, Sp. *Avenas.*)

The well known cereal *Avena satira*. There are more than 40 species of avena, and these are widely distributed over the temperate and cold regions of the globe. The area of cultivation is wider than that of wheat, and in the United Kingdom oats are cultivated to double the extent of wheat. Scotch-grown oats are superior to English-grown. The deficiency of the British supplies is made up by imports from northern Europe generally, and especially from Russia. The grain itself is principally used as a horse food, but it is a valuable human food stuff when ground into meal for the purpose of making porridge and cakes.

Ochre. (Fr. *Ocre*, Ger. *Ocher, Oker*, Sp. *Ocre.*)

Compact earth or clay composed chiefly of silica and alumina together with the oxides of various metals.

The principal ochres are the yellow and the red, the colouring matter of the former being hydrated oxide of iron, and that of the latter hydrated sesquioxide. Another ochre, commonly known as amber, is coloured by the presence of manganese in addition to the oxide of iron. Ochres are used as painters' and artists' pigments, and are remarkable for their stability, as may be seen by the pictures of the old masters. The natural product is obtained in several English counties, notably Somerset, Devonshire, and Anglesea. There are also deposits of considerable value in Holland and France, those of Vierzon in the latter country being much esteemed for their rich yellow colour. The imports are not very considerable, the home supply being nearly sufficient for all ordinary demands.

Oil Cake. (Fr. *Tourteau*, Ger. *Oelkuchen*, Sp. *Torta.*)

Cake left or made out of the solid residue after the extraction of oil from various seeds, the principal being those of the linseed, the rape, the poppy, the cotton, and the palm nut. The cake possesses highly nutritious value as retaining a part of the oil and the whole of the nitrogenous and essential constituents. Oil cake is used principally for feeding sheep and cattle. By means of the ordinary presses about 90 per cent. of the oil of the various seeds is extracted, the cake thus retaining 10 per cent. of oil. If, however, the seeds are treated with bisulphide of carbon the whole of the oil may be drawn away. The cake is then less valuable as a feeder, but may be used as a manure. In addition to the quantity produced at home Great Britain imports annually some 300,000 tons from different countries.

Oil Palm. (Fr. *Palmier oléagineux*, Ger. *Oelpalme*, Sp. *Palmera.*)

A tree belonging to the palm order, of which the Guinea oil palm is the most important as yielding the palm oil of commerce. It is a low-growing species abounding in tropical West Africa. The fruits from which the oil is obtained are borne in dense heads, and the seeds are enclosed in a hard bone-like shell of a yellow colour. The fruits are first boiled and then crushed in mortars. They are then placed in large vats filled with water, and the oil is trodden out and comes to the surface. After collecting and boiling to get rid of some of the water the oil is ready for exportation. The best palm oil has the consistence of butter, and is yellow in colour. When fresh its smell is exceedingy agreeable. In Africa the natives used the substance for culinary purposes. In Europe palm oil is employed very extensively in the manufacture of candles and soap, and for greasing the axles of railway carriage wheels. The export of palm oil is perhaps the greatest of the West African industries.

Oils. (Fr. *Huiles*, Ger. *Oel*, Sp. *Oleos.*)

The name applied generally to all fluid substances of whatever nature which flow with a certain degree of viscosity. They are divided into two main groups, fixed oils and volatile or essential oils. The latter are generally obtained by distilling the leaves, flowers, etc., of plants with water. Their principal ingredients are hydrocarbon closely allied to turpentine, together with small quantities of oxidized products and resins. They are inflammable, leave a greasy mark on paper, which is removed by warming, feel harsh when rubbed on the skin, and may be distilled without undergoing much change. Most essential oils have a powerful odour which varies acocrding to the nature of the plant from which it is obtained. Among the principal oils of this class are those of lemon, orange, juniper, peppermint, and cloves. Fixed oils cannot be distilled without undergoing decomposition. They are inflammable, leave a permanent stain on paper, and have an oily feel when applied to the skin. They are divided into the two classes of animal and vegetable oils, according to their origin. The former are obtained from various animal fats by pressure and heat or by allowing the oil to drain away; the latter are obtained from seeds by powerful pressure. Both classes consist largely of glycerides, that is, compounds of glycerine with stearic, palmitic, oleic, and similar acids, and undergo saponification when treated with an alkali. Another further division of fixed oils is into those of drying and non-drying oils.

The former become solid when exposed to the air, the latter do not. Drying oils are mainly used for mixing painters' colours, the principal of these being linseed, poppy, hemp, grape-seed, honesty, castor, cotton seed, and croton. The non-drying are employed for the purposes of illuminating and soap making, and the chief of these are olive, almond, ben, laurel, rape, palm, spurge, and candle-nut. The drying of the drying oils is due to the absorption of oxygen, and the formation of oxidized products. The other uses of oils are very numerous, and many of these are noticed under separate heads.

Oleomargarine.

(See *Butter and Margarine.*)

Oleo Oil. (Fr. *Huile d'oleo*, Ger. *Oleïnöl*, Sp. *Oleo de oleo.*)

A compound of oleic acid and glycerine, extracted from beef suet. It is exported from the United States in very large quantities, Holland and Germany taking the greater portion. In both countries the oil is used in the manufacture of margarine.

Olibanum. (Fr. *Oliban*, Ger. *Weihrauch, Weihraud-Körner*, Sp. *Olibano.*)

The gum resin obtained from several species of Boswellia, especially the *Boswelia thurifera*, a native of India, but which is now also found in the south of Arabia or in Somali Land. The resin flows from incisions made in the bark of the tree in the form of tears about an inch long, and hardens on exposure to the air. The pieces of olibanum vary in colour from light yellow to dark green, but some are colourless. It is now used chiefly as a fumigant, and as an incense in religious worship, possessing a beautiful aromatic odour when burned. It was much employed at one time medicinally as an ingredient in the manufacture of stimulating plasters, but its use has become practically obsolete. The greater portion of the trade in olibanum is done by Aden.

Olive. (Fr. and Ger. *Olive*, Sp. *Oliva.*)

A genus of trees or shrubs of which there are about 30 species widely distributed over the warmer temperate regions of the globe. The common olive, *Olea Europea*, is a native of Syria, but it is found in all parts of Southern Europe. The unripe fruit is pickled and consumed both in the countries where the olive is found and abroad. The best pickled olives imported by Great Britain are obtained from Genoa and Marseilles, but good qualities are sent out from Leghorn and Naples. The wood of the olive is used by cabinet makers. The most important product of the olive is olive oil. This substance is the cream and butter of Italy and Spain. The oil is contained in the fleshy part of the fruit and is extracted by pressure. There are three qualities. For the first the fruit is placed in woollen bags and a slight pressure applied. The oil thus obtained is the virgin olive oil, and is of the finest quality. The remaining pulp is moistened with water and by repeating the pressure, though to a greater extent, the second class of olive oil is obtained. A third steeping in water and a further pressure gives the third class of oil. The first two are useful and fit for domestic purposes, the third only for manufacturing processes. The best olive oil is made in Tuscany, and Italy is the chief exporting country.

Onions. (Fr. *Oignons*, Ger. *Zwibeln*, Sp. *Cebollas.*)

The well-known edible bulb, the product of the *Allium cepa*, largely cultivated in the United Kingdom, and imported from Holland, Belgium, Spain, Portugal, Malta, and Egypt. The uses to which onions are applied are very numerous. When young they are made into salads, when mature they are an important culinary article. Smaller onions are pickled. The Spanish and Portuguese varieties are remarkable for their size and flavour, and are in great demand. Welsh onions never form a bulb, but are used for making spring salads. The strong taste and smell of onions are due to the presence of a volatile oil rich in sulphur, which is said to induce sleep.

Opal. (Fr. *Opale*, Ger. *Opal*, Sp. *Opalo.*)

A precious stone, a modified form of quartz. It consists mainly of silica, but other constituents are present, especially alumina and oxide of iron. It has a vitreous lustre, inclining to the resinous, but no crystalline structure. Its colour varies from white to red, green, or grey, but it is often darker owing to the presence of certain

impurities. There are many varieties of the opal, the finest kind being the precious or oriental opal. This is semi-transparent, and exhibits a beautiful play of brilliant colours, commonly known as opalescence. In other specimens the colour varies according to the angle at which the light strikes the mineral. Opals are used as jewellery for setting in rings and brooches. The finest stones are obtained from Hungary, but precious opals are also found in Saxony, Queensland, and South America.

Opium. (Fr. *Opium*, Ger. *Opium, Mohnsaft*, Sp. *Opio.*)

One of the most valuable medicinal drugs. It consists of the dried juice of the unripe heads of a species of white poppy, the *Papaver somniferum*, grown in Turkey, Persia, India, and China. The cultivation of the poppy for the sake of the opium is mainly carried on in Bengal and Oude. It is exported from India to China in enormous quantities. Great Britain derives its supply of opium to a large extent from Persia and Turkey. In the former country it is prepared at Ispahan, Shiraz, and Yezd, that coming from the last named town being considered the best. To procure opium the unripe capsules or poppy heads are scratched with a peculiar kind of knife, and the exuding juice is collected in earthenware vessels on the day after the incision has been made. The thick liquid is subjected to various kinds of treatment and the opium is made up into cakes or bulbs and left on racks to dry. Much care is required both in the manufacture and in the drying, and the quality of the drug depends upon the peculiar treatment it receives. The best varieties of opium are soft dark brown or reddish brown masses, possessing a peculiarly disagreeable odour and a persistent acrid taste. Its medicinal value is owing to the fact of the presence of so many different alkaloids, the most important of which are morphine, narcotine, codeine, narcine, thebaine, and papaverine. Opium is a valuable sedative and anodyne, and a stimulant when taken in small quantities. Its abuse may lead to grave results. Laudanum is a tincture of opium. It is composed of opium dissolved in dilute alcohol.

Opodeldoc. (Fr. *Baume opodeldoch*, Ger. *Opodeldok*, Sp. *Linimento Saponáceo.*)

Another name for soap liniment, a compound of hard soap, camphor, oil of rosemary, rectified spirit, and distilled water. It is sometimes used as an embrocation in cases of external injuries. Arnica opodeldoc is prepared from white soap, rectified spirits, camphor, and tincture of arnica.

Opopanax. (Fr. *Opopanax*, Ger. *Opopanax, Panargummi*, Sp. *Opopónaco.*)

A gum resin obtained from the *Opopanax chironium*, a species of parsnip found in Southern Europe and also in Persia. It is an opaque substance found in tears and has a balsamic odour resembling that of myrrh. It is sometimes used medicinally as an antispasmodic. What little of opopanax comes to England is imported from Persia.

Opossum. (Fr. *Sarigue*, Ger. and Sp. *Opossum.*)

A pouch bearing animal found in various parts of America, from the United States to the Argentine Republic. The animal is hunted for the sake of its fur. Opossum skins are imported in great quantities, over one million being sold at a single sale in London some years ago. The skins are generally made into chest protectors. Another industry in which they are employed is glove making.

Orange. (Fr. *Orange*, Ger. *Orange, Apfelsine*, Sp. *Naranja.*)

The edible fruit of a species of *citrus*, much prized for its delicacy and wholesome qualities. The common orange tree is an evergreen and bears white flowers. It is extensively cultivated in Southern Europe, and in every other part of the world where the climate is suitable. Two well-known varieties of the common orange are the St. Michael's, with thin yellow rind and sweet seedless pulp, and the Malta or blood, with the pulp streaked with crimson. Other varieties are the Mandarin, introduced from China, the fruit small and flattened, the Bergamot, globose or pear-shaped, and the bitter or Seville. The last named are grown in large orchards in Spain, not only for the sake of their fruit, but also for the flowers from which the essential oil of oranges,

used for making Eau de Cologne, is obtained. The rind of the Seville oranges is used for the manufacture of candied peel, and for the best marmalade. Orange essences are often used medicinally as an addition to infusions and decoctions. In England an orange wine is made which contains about 12 per cent. of alcohol and some free acid. The supplies required by Great Britain are derived from the various Mediterranean countries and from the United States.

Orchids. (Fr., Ger., and Sp., *Orchis.*)

A very large family of curious plants, of which some thousands of varieties are known, mostly indigenous to tropical regions. The rare specimens command exceedingly high prices, and a very large trade is done by collectors and growers.

Orchil. (See *Archil.*)

Ores. (Fr. *Minerais*, Ger. *Erze*, Sp. *Quijos.*)

The crude mineral sources of metals, or the natural form in which they are found, and from which they are extracted by various processes of smelting, etc. To constitute the substance an ore, the mineral must not only contain the metal, but must contain it in such a form that the process of extraction can be carried out with profit. Thus iron pyrites are not used as an iron ore owing to the difficulty of obtaining the iron separate from the sulphur. The most important ores are oxides, in the case of iron, copper, and tin; sulphides, in the case of lead, zinc, and antimony; and carbonates in the case of iron, zinc, and lead. The principal ores of the chief metals are noticed under separate headings, together with their characteristics and places of origin.

Organzine. (Fr. *Organsin*, Ger. *Organsin*, Sp. *Organsino.*)

A variety of thrown silk. When reel threads of silk are twisted they are called "singles," but when two or more of these singles are twisted together in contrary directions the result is known as organzine.

Ormolu. (Fr. *Ormolu*, Ger. *Malergold*, Sp. *Oro molido.*)

The name of a mixture of copper and zinc, which is made to resemble gold in colour. The meaning of the word is beaten gold. The yellow colour is sometimes increased by the addition of a little sulphuric acid. Ormolu is used for casting into ornaments.

Orpiment. (Fr. *Orpiment*, Ger.) *Operment, Rauschgold*, Sp. *Oropimento.*)

A sulphide of arsenic, a brilliant yellow pigment, known as king's yellow. The finest qualities are derived from Persia, where it occurs in its natural state as a mineral. Artificial orpiment is made by heating a mixture of white arsenic and sulphur.

Orris Root. (Fr. *Racine d'iris*, Ger. *Veilchenwurzel*, Sp. *Raiz de violeta.*)

The root of the *Iris florentina*, a plant extensively grown in Tuscany. At one time it was used medicinally as a stimulant, but its chief use at the present day is in perfumery. The dried root is ground into a powder, and when mixed with wheat starch forms the violet powder of commerce. It has the pleasant smell of violets, and is employed in scenting hair and tooth powders. It is also used for flavouring liqueurs. The whole supply of orris root is obtained from Leghorn.

Osiers. (Fr. *Osiers*, Ger. *Korbweiden*, Sp. *Mimbres.*)

The twigs or shoots of a species of willow used for basket making and wicker-work. The common osier, *Salix viminalis*, is found in Britain and many parts of Europe. It is estimated that nearly 10,000 acres are devoted to the cultivation of the osier in this country, but the demands of Great Britain have to be met by large importations from Holland, Belgium, and France. After the osiers are cut they must be carefully stacked and kept dry and cool, otherwise they are liable to rot and to become worthless for manufacturing purposes.

Osmium. (Fr., Ger., and Sp., *Osmium.*)

A very rare metal, always found associated with platinum and alloyed with other metals, especially iridium. It is the most infusible of all metals, and is the heaviest substance known, its specific gravity being 22·5. It forms a poisonous volatile oxide of irritating odour, an aqueous solution of which rapidly hardens animal tissues. For this reason the oxide is used in the preparation of such tissues for microscopical examination.

Osnaburg.

A species of coarse linen fabric or kind of canvas, manufactured for negro clothing. Its name is derived from the fact that it was originally manufactured at Osnaburg, in Germany.

Ostrich Feathers. (Fr. *Plumes d'autruche*, Ger. *Straussfedern*, Sp. *Plumas de avestruz.*)

The long plumes of the ostrich, which have been valued for centuries for ornamental purposes. They are obtained from the wing and the tail, each wing giving about 25 good feathers and the tail about a dozen. They are divided into many classes in commerce according to their colour and length, and the prices vary to a considerable extent. The principal supplies are obtained from South Africa where the ostrich is domesticated for the sake of the feathers. Efforts have been made, with some success, to extend the farming to Algiers, Egypt, West Africa, Australia, and California. The American ostrich, however, is of a genus totally distinct from the African ostrich.

Oswego Corn. (Fr. *Farine de maïs*, Ger. *Maismehl*, Sp. *Harina de maiz.*)

The flour made from Indian corn, the manufacture of which is carried on at Oswego, a town of the United States, situated on Lake Ontario.

Otter Skins. (Fr. *Peaux de loutre*, Ger. *Otterfelle*, Sp. *Piel de vibora.*)

The skins of two distinct animals, the land otter and the sea otter. More than 10,000 of these skins are annually imported into Great Britain from North America, those of the sea otter being among the choicest furs of commerce. They are used for the manufacture of muffs, gloves, and trimmings.

Otto of Roses. (Fr. *Huile de rose*, Ger. *Rosenöl*, Sp. *Aceite rosado.*)

Also called Attar of roses. It is a volatile oil obtained by distilling the flowers of the cabbage and damask roses. It is a colourless or light yellow solid at temperatures below 80° F. Otto of roses is used for making preparations for the hair and for various perfumes. The supplies of this substance are obtained from the East, the cultivation of roses for its preparation being carried on in Roumelia, Syria, Persia, and India. The annual value of the imports into Great Britain is not far short of £100,000.

Ova. (Fr. *Frai*, Ger. *Laich*, *Rogen*, Sp. *Freza.*)

The proper meaning of this word is eggs, but it is generally applied to the spawn of fish. In the endeavours to introduce and acclimatize food fishes into various parts of the world, large quantities of ova of salmon and other fish are sent out and form no inconsiderable article of commerce. Salmon spawn is sent chiefly to Australia and New Zealand.

Oxalic Acid. (Fr. *Acide oxalique*, Ger. *Oxalsäure*, *Sauerkleesäure*, Sp. *Acido oxálico.*)

An extremely poisonous acid, the salts of which occur abundantly in the vegetable kingdom. It is produced by the oxidation of many organic compounds, but its manufacture is conducted on a large scale by oxidizing saw-dust with a mixture of the hydrates of potash and soda, the mixture being in the proportion of one to two. Another mode of preparation is the oxidation of starch or sugar by nitric acid. Its chemical symbol is $H_2C_2O_4 + 2H_2O$. Oxalic acid is employed to a considerable extent in cotton printing, straw bleaching, etc.

Ox Tongues. (Fr. *Langues de bœuf*, Ger. *Ochsenzungen*, Sp. *Lenguas de buey.*)

The tongues of oxen prepared and tinned in South America. Enormous quantities are shipped annually from Uruguay, the most prized being obtained from Paysandu.

Oysters. (Fr. *Huitres*, Ger. *Austern*, Sp. *Ostras.*)

The well-known edible mollusc, that most used for culinary purposes being the common oyster. Naturally oysters are found on banks several fathoms deep, and the spawning takes place in the early summer. The spawn, known as spats, is extensively collected and transferred to artificial grounds in very shallow water. The oysters thus cultivated are called natives. The chief home supply is obtained from Colchester, where oysters have been a staple product for centuries. Large quantities, however, are imported from France, Holland, and the United States, the trade with the last named country having developed with great

rapidity. The pearl oyster belongs to a genus totally different from that of the common oyster.

Ozokerit. (Fr. *Ceresine, Cire minéral*, Ger. *Ozokerit, Ceresin, Erdwachs*, Sp. *Ozokerite, Ceresine.*)

A kind of earth-wax or solid paraffin found naturally in Galicia and Moldavia. The best kind is green or yellow in colour and transparent, the inferior being dark brown and almost opaque. It is soft in character and can be easily kneaded in the hand. Pure ozokerit has a high melting point and excellent illuminating power. It is in consequence much employed for the manufacture of candles.

Palisander Wood. (Fr. *Palisandre*, Ger. *Palisanderholz*, Sp. *Madera de palisandre.*)

The timber of several Brazilian trees, especially the *Dalbergia nigra*, used for making furniture. The name is sometimes given to rosewood, striped ebony, and violet wood.

Palladium. (Fr., Ger., and Sp., *Palladium.*)

One of the noble metals, resembling platinum in many respects, and generally associated in its ores with platinum. It is white and hard, and does not tarnish when exposed to the atmosphere. For these reasons it is especially suitable for the construction of philosophical instruments, but its cost is too great to allow of its common use. Palladium is sometimes used for the construction of small weights, and in commerce it is met with as foil or wire.

Palm Oil.

(See *Oil Palm.*)

Panama Hats. (Fr. *Chapeaux de Panama*, Ger. *Panamahüte*, Sp. *Sombreros de Panama.*)

Light straw hats, made from the finely plaited leaves of the *Carludorica palmata*, a screw pine tree of South and Central America. These hats are much prized in the tropics on account of their lightness, durability, and flexibility. They are not spoiled by rain, the freshness of their colour being easily reproduced by the application of soap and water. The plaiting of the straw is a very tedious and difficult process, and consequently good Panama hats are sold at high prices. The principal supplies are obtained from Ecuador and Colombia in South America. There is now an extensive trade done in imitation Panama hats.

Paper. (Fr. and Ger. *Papier*, Sp. *Papel.*)

The common writing material known in various forms for many centuries. At one time it was manufactured from the papyrus, (whence its name,) or from the paper mulberry. Now it can be made from numerous vegetable substances, but those available in Europe at a reasonably low price are few in number, the principal being linen, rags, esparto grass, coarse straw, and wood pulp. The vegetable fibres used are first treated chemically to get them as clean as possible, and then beaten to pulp under water to obtain consistency in the material. As the quality of the paper to be made depends upon the careful preparation of the pulp, this process is one of the utmost importance. The manufacture of all kinds of paper is now carried out by machinery. The pulp is deposited in a vat whence it flows to a band of wire gauze which is kept in constant motion. The water in the pulp drains away during the process, and the pulp itself is dried by passing through sheets of felt and heated rollers. The paper comes out at the end of the machine opposite to that in which the pulp is introduced in one continuous sheet of great length. Coloured paper is made by colouring matter being added to the pulp before leaving the vat. The weight and body of paper are increased by the addition of various mineral substances, notably plaster of Paris. Blotting paper has a certain amount of wool in its constitution.

Papier-mâché. (Fr. *Papier-mâché*, Ger. *Papier-macher*, Sp. *Papelero.*)

The hard, light, and durable substance prepared by compressing paper pulp into moulds in various forms, or by pasting sheets of paper together and subjecting them to high pressure. It is much used for making small boxes, cabinets, trays, etc., and for the architectural decoration of interior walls and roofs. Unless intended for architectural ornament, papier mâché is generally varnished or japanned, gilded, and inlaid. The inlaying is often done with mother-of-pearl shell. The trade is an important Birmingham

industry, and imitations of the lacquer work of Japan and China are largely produced. A special papier mâché is that known as ceramic, a soft substance which can be easily worked into any required form. It is a mixture composed of paper-pulp, resin, glue, drying oil, and sugar of lead.

Paraffin. (Fr. *Paraffine*, Ger. *Paraffin*, Sp. *Paraffine.*)

Paraffins are a series of hydrocarbons, occurring as gases, liquids, or solids, according to the proportion of carbon present in them. They are prepared by the destructive distillation of bituminous shale, or as a bye-product in the manufacture of coal gas. The shale is broken into small pieces and heated in retorts, when inflammable gases, oil, and water distil over. The oil is collected and subjected to a second distillation, from which the paraffin oil of commerce is obtained. The heavier oil obtained is used for lubricating purposes. The residue on this second distillation is solid paraffin, and when purified forms the paraffin wax of commerce. Solid paraffin is an odourless and tasteless substance, nearly as hard as beeswax, melting at a temperature of 100° to 140° Fahr. Its principal use is for making candles, a certain amount of stearin being added to the paraffin. It is also used in the manufacture of lucifer matches as a substitute for sulphur, and it can be utilized as a substitute for wax in modelling flowers and fruits. The natural oils of America and Russia, sometimes included under paraffins, are more commonly known as petroleum.

Paraguay Tea. (See *Maté.*)

Parchment. (Fr. *Parchemin*, Ger. *Pergament*, Sp. *Pergamino.*)

The prepared skins of various animals, used for the purpose of writing upon, especially by lawyers for deeds. Ordinary parchment is made from the skins of sheep and goats; vellum, a fine variety of parchment, from the skins of young calves, kids, or lambs. A parchment used by bookbinders is prepared from pigskin. The parchment used for drums is made from asses' skins. The preparation of this substance resembles that of leather in its early stages. The hair and adhering pieces of flesh are carefully removed from the skins, which are then stretched tightly over a frame. The skins are variously treated with special tools, and afterwards rubbed with lime and pumice stone. Still stretched they are allowed to dry, and any roughness is removed during the drying process by fresh scraping and rubbing. A curious substance known as vegetable parchment is prepared by dipping ordinary paper into a mixture of sulphuric acid and water, and removing the acid after a few seconds' immersion. The paper undergoes a remarkable change, and becomes about five times as strong as ordinary paper. It is not so useful as true parchment, but its strength renders it a valuable material for tracing designs, plans, etc.

Parsley. (Fr. *Persil*, Ger. *Petersilie*, Sp. *Perejil.*)

The well-known culinary herb, found in most parts of Europe. A peculiar variety, with white carrot-like roots, is imported into England from Hamburg. Parsley is well adapted for giving flavour to soups and stews.

Parsnip. (Fr. *Panais*, Ger. *Pastinake*, Sp. *Pastinaca.*)

A genus of plant of the same natural order as parsley, cultivated on account of its root, which is, like the carrot, a palatable and nutritious vegetable. In colour it is white. The parsnip is grown in all parts of Europe, and in the north of Asia. Besides being used as a vegetable, a fermented liquor is made from it in Ireland, and in England parsnip wine is manufactured from it. A spirit similar to potato spirit can be extracted from the root.

Partridge Wood. (Fr. *Bois de perdrix*, Ger. *Rebhuhnholz*, Sp. *Madera de perdiz.*)

The trade name for various kinds of wood imported into Europe from South America and the West Indies, having a red colour, and streaked in the same manner as the partridge. One of the most valued of the trees from which the timber is obtained is the *Andira inermis.* The wood is used by cabinet makers, and it is likewise employed for making walking sticks, parasol handles, and similar fancy articles.

Patchouli. (Fr., Ger., and Sp., *Patchouli.*)

A substance used as a perfume,

prepared from the dried branches of a species of Pogostemon, a native of the East Indies, and grown also in India and Ceylon. The odour of patchouli is very powerful and resembles that of sandalwood. The perfume has been known in England for rather more than half a century, but previous to that time it was used for imparting a scent-like smell to Cashmere shawls. In India it is used as an ingredient in the manufacture of fancy tobaccos, and also for a hair perfume. Before use in Europe it is greatly diluted.

Peach. (Fr. *Pêche*, Ger. *Pfirsiche*, Sp. *Albérchigo*, *Abridor.*)

The velvety edible fruit of a species of trees belonging to the same genus as the almond, of the natural order *Rosaceae.* The growth of peaches is widespread throughout the temperate regions of the world, and the fruit is much prized as a peculiar delicacy. There are no less than 200 varieties of the fruit. One of the divisions of peaches is into clingstones and freestones, according as the pulp clings to or is easily detached from the stone. The cultivation is most extensive in the United States, whence peaches are exported both fresh and tinned. The flowers and the leaves of the peach tree have the smell of bitter almonds, and a preparation known as peach water is prepared by distilling the bruised leaves. The smooth variety of the peach is called nectarine. The wood of the peach tree is sometimes used by turners and cabinet makers, and is valued for its compactness and smoothness.

Pear. (Fr. *Poire*, Ger. *Birn*, Sp. *Pera.*)

The well-known fruit of the *Pyrus communis*, a tree widely distributed through Europe and Asia. It is extensively cultivated in England, especially in some of the western counties, where there are extensive orchards devoted to the purpose. Besides its common use as a dessert fruit, the pear is the source of perry. (See *Perry.*)

Pearl. (Fr. *Perle*, Ger. *Perle*, Sp. *Perla.*)

The substance formed by several shell bearing molluscs, which are provided with a secretion with which they line their shells. The secretion is laid in thin semi-transparent films, and gives rise, by reason of the arrangement, to a beautiful iridescence. The pearls of commerce, which consist of rounded secretions of a substance called nacre, are the result of accident. The nucleus of the pearl is a grain of sand or other particle of solid matter which becomes coated over with the nacreous secretion. The principal source from which pearls are obtained is the pearl oyster. The chief fisheries are off Ceylon, but others exist in the Persian Gulf, the West Indies, and Australia. Pearls are of various colours, white, black, and pink, and their value depends upon their size and purity. Excellent imitations are manufactured for necklaces and decorative purposes, the French being very clever in this peculiar industry. (See *Mother of Pearl.*)

Pennyroyal. (Fr. *Pouliot*, Ger. *Poleiminze*, Sp. *Poleo.*)

A species of mint, *Mentha pulegium*, distinguished from other varieties by the size of its leaves. It is found in most countries of Europe and Western Asia. It is much used as a flavouring condiment by the poorer classes of the community, and an essential oil is obtained from its leaves which is largely used in medicine.

Pepper. (Fr. *Poivre*, Ger. *Pfeffer* Sp. *Pimienta.*)

The fruit of various plants of the natural order *piperaceae.* The principal of these plants is the common or black pepper which is cultivated in most tropical countries. The fruit or corn, which is about the size of a pea, is gathered when red. It is dried in the sun, and then becomes the black pepper of commerce. White pepper is the same fruit freed from its outer covering by being soaked in water, and afterwards rubbed. This so-called white pepper is of a whitish grey colour, and is often bleached with chlorine. Pepper is a well-known condiment and possesses pungent, acrid, and aromatic properties. The black is more pungent than the white, as the essential qualities of the fruit are found more plentifully in the outer parts of the corn than in the seed. The best black pepper is obtained from the Malabar coast, and the finest qualities of white pepper are derived from Penang. The name pepper is

given to various substances which have a pungency similar to pepper, though derived from different plants, such as cayenne, pimento, and Malaguetta pepper.

Peppermint. (Fr. *Menthe poivrée*, Ger. *Pfeffermünze, Pfeffermünzkraut*, Sp. *Menta, Yerba buena.*)

The aromatic plant, *mentha piperita.* It is largely cultivated in England in the counties of Surrey, Cambridge, and Lincoln. The aromatic oil is derived from its leaves when in a dried state. There are, however, considerable imports from Japan and the United States. (See *Mint.*)

Pepsine. (Fr. *Pepsine*, Ger. *Pepsin*, Sp. *Pepsine.*)

An albuminous substance, one of the principal constituents of gastric juice. It is a medicinal food digestive, prepared from the walls of the stomach of calves, sheep, and pigs, that derived from the pig being considered the best. Its chemical constitution is not accurately known. Pepsine appears in commerce in the form of an essence, powder, or wine, and it is an important element in all preparations which are manufactured to aid digestion.

Perfumes. (Fr. *Parfums*, Ger. *Parfüme*, Sp. *Perfumes.*)

The principal perfumes are noticed under separate headings.

Perry. (Fr. *Poiré*, Ger. *Birnmost*, Sp. *Bebida de peras.*)

A fermented liquor made from pears in exactly the same manner as cider is prepared from apples. When bottled it makes a very good imitation champagne, containing from 5 to 9 per cent. of alcohol. The chief counties in which the business of perry making is carried on in England are Worcester, Gloucester, Hereford, and Devonshire.

Persian Berries. (Fr. *Grains persans*, Ger. *Persische Gelbbeeren*, Sp. *Grano perso.*)

The product of a Persian tree *Rhannus cothartícus.* They are of a yellow colour and are used as a dye in calico printing.

Persian Powder. (Fr. *Poudre persaune*, Ger. *Persisches Pulver*, Sp. *Polvos persos.*)

The powdered flowers of the *Pyrethrum carneum* and the *Pyrethrum roseum*, wild plants growing in Persia and the Caucasus. The powder is useful as an insect destroyer.

Persimmon. (Fr. *Dattier de Virginie*, Ger. *Virginiendattel*, Sp. *Datil de Virginia.*)

The Virginian date plum, a tree which attains a height of 50 or 60 feet, and produces hard and elastic wood. Its fruit is the same as that of the ordinary date plum, and its bark is used medicinally as a febrifuge, and in cases of diarrhœa and cholera. (See *Date Plum.*)

Peru Balsam. (Fr. *Baume de Pérou*, Ger. *Perubalsam*, Sp. *Balsamo de Peru.*)

The exudation of several species of trees, especially the *Toluifera*, found in South America. It is odoriferous and has the colour and consistence of dark molasses. The exudation when collected is put into boiling water and the balsam floats on the surface. It is skimmed off and boiled again so as to purify it. Peru Balsam is often used in the manufacture of confectionery, and medicinally it is valuable in cases of throat irritation. (See *Balsam.*)

Peruvian Bark.

(See *Cinchona.*)

Petroleum. (Fr. *Pétrole*, Ger. *Petroleum, Bergöl*, Sp. *Petróleo.*)

Also called rock oil. It is a thick oil consisting mainly of a mixture of paraffins, olefines, and hydrocarbons of the benzene series. It is found chiefly in the United States, Canada, and Russia, the most celebrated springs in the last named country being at Baku. It oozes from the ground in natural springs, though additional supplies are obtained by boring and pumping. Petroleum is supposed to be the result of the natural distillation of coal and shale taking place beneath the surface of the earth. When it is obtained in its natural condition it is unfit for use, but is subjected to fractional distillation. The products thus derived are of three different kinds. The first consists of light oils, such as benzoline, which are highly inflammable and dangerous as illuminants. The second, or refined petroleum, are the illuminating oils, especially the paraffin oil of commerce. The third are the heavy oils used as lubricants. Petroleum has been and is still used to a certain extent as a fuel for steam

boilers. The bye products obtained from petroleum are extremely numerous, including lampblack, dyes, carbolic acid, aniline, saccharine, oil of mirbane, vaseline, etc.

Pewter. (Fr. *Potée d'étain*, Ger. *Zinnasche, Zinnkalk.* Sp, *Taño calcinado, Esmeril.*)

A common and useful alloy used for the manufacture of jugs, pots, plates, etc. It is composed of tin and antimony, with the addition of either copper or lead, the former giving the better result. The best pewter, however, is an alloy of tin, antimony, copper, and bismuth. It has a silvery white appearance, and when well made will not easily tarnish.

Phenol.

(See *Carbolic Acid.*)

Phormium. (Fr., Ger., and Sp., *Phormium.*)

A plant of New Zealand, formerly known as New Zealand flax, but now classed as hemp. The fibre is exported, and in Scotland it is manufactured into sacking, sheeting, towelling and table-cloths. The ropes made from the fibre are not of great strength, as they snap when knotted.

Phosphates. (See *Manure.*)

Phosphorus. (Fr. *Phosphore*, Ger. *Phosphor*, Sp. *Fósforo.*)

One of the non-metallic elements. At ordinary temperatures it is a faintly yellow substance, with the appearance and consistence of wax. Its specific gravity is 1·83. It fuses at 111° Fah., and takes fire at 140° Fah. Owing to the low temperature at which it catches fire and also to the serious nature of burns caused by it, great care is required in the handling of this substance. Phosphorus does not occur free in nature, but it is found in almost all animal and vegetable tissues. It is generally prepared by treating burnt bones with concentrated sulphuric acid. Superphosphate of calcium and an insoluble sulphate of calcium are produced. The former is separated, evaporated to a syrup, mixed with charcoal, again evaporated to a dry mass and heated in an earthen retort. The phosphorus distils over as a vapour, and is condensed in water. When further purified it is made into sticks. Phosphorus is of much chemical value, and enters into numerous compounds. It is invaluable in the composition of many artificial manures and also of various medicines. Its most important industrial use is in the manufacture of lucifer matches.

Physic Nut.

A shrub of tropical America and also of the East Indies, called *curcas purgans*, which yields seeds of considerable medical value. These seeds contain an acrid fixed oil which has many of the properties of castor oil, and which forms a substitute for it. In America the oil is used for lamps and also for dressing cloth. The East Indian variety is used by the Chinese for the preparation of a varnish, which is obtained by boiling the oil with oxide of iron.

Piassava. (Fr., Ger., and Sp., *Piassava.*)

Also called Piassaba and Piacaba. The name of the vegetable fibre of two species of palm found in Brazil. The fibre is obtained from the stalks of the fan-like leaves of the palm and exported in large bundles from Bahia and Para. It is used for the manufacture of coarse brooms and brushes and also for street sweeping machines. In Brazil it is employed in the manufacture of an inferior kind of rope.

Pickles. (Fr. *Conserves au vinaigre*, Ger. *Pökel*, Sp. *Salmuera.*)

Various fruits, vegetables, and spices specially prepared in different countries for home consumption and also for export. The most important of these are noticed under separate headings.

Picric Acid. (Fr. *Acide picrique*, Ger. *Pikrinsäure*, Sp. *Acido amargo.*)

An acid met with in yellow crystals obtained by the action of nitric acid on equal parts of carbolic and concentrated sulphuric acid. Its chemical symbol is $C_6 H_2 (NO_2)_3 OH$. It is largely prepared in France and is used as a yellow dye for silk, wool, and leather.

Pigskins. (Fr. *Cuir de cochon*, Ger. *Schweinsleder*, Sp. *Cuero de puerco.*)

The tanned skins of pigs are much used for saddlery, book-binding, portmanteau coverings, etc. They are also used in the manufacture of certain kinds of boots and leggings, and more recently they have been applied to dressing bags and to coverings for

furniture. Besides those obtained at home there are large imports from the pig centres of America.

Pilchard. (Fr. *Sardine*, Ger. *Sardelle, Pilchard*, Sp. *Sardina.*)

A fish of the herring family, abundant off the coasts of Devonshire and Cornwall, and off the south-west coasts of Ireland. The fish is prepared on a large scale in Cornwall, as sardines are prepared in France, and from 15,000 to 20,000 hogsheads are annually exported from that county for Mediterranean countries. The French sardine belongs to the same family as the pilchard, but is smaller.

Pimento. (Fr. *Piment*, Ger. *Piment, Nelkenpfeffer*, Sp. *Pimienta de Jamáica.*)

The well known spice, the dried aromatic berries of the *Eugenia Pimenta*. The tree is cultivated in many of the West India Islands, but the supply of pimento comes almost exclusively from Jamaica, hence its alternative name, Jamaica pepper. The fruit is gathered when the berries are green, and dried in the sun. The colour then becomes brown. Each berry is about the size of a pea and contains two dark brown seeds. Pimento has a peculiar taste and smell, resembling that of a mixture of cinnamon, nutmeg, and cloves. For this reason the name allspice has been given to it. In cookery and confectionery it is largely used, and it is also prescribed to a certain extent medicinally, though mainly for the sake of giving flavour to other drugs.

Pine. (Fr. *Pin*, Ger. *Fichte*, Sp. *Pino.*)

A most important genus of trees belonging to the natural order of *Coniferae*. There are over 100 species of this tree, and they abound in the temperate and cold regions of Europe, Asia, and America. The only species indigenous to Britain is that erroneously known as the Scotch fir. Besides its value as a timber tree, the pine is valuable economically for the tar, pitch, resin, and turpentine obtained from its branches.

Pineapple. (Fr., Ger., and Sp., *Ananas.*)

A much valued and delicious tropical fruit, the product of the *Ananas sativa*. Large quantities are exported from the Bahamas and the Azores. Owing to the fact that hot-house pineapples are considered better than those of the West Indies, the English foreign supply is derived almost exclusively from the Azores. West Indian pines are sent to the United States where an immense trade is carried on in canning the fruit both for the home and for foreign markets.

Pins. (Fr. *Epingles*, Ger. *Stecknadeln*, Sp. *Alfiler.*)

These wire fasteners, which are in universal demand, are now made exclusively by machinery. Their manufacture is a characteristic industry of Birmingham, though to a less extent they are made in London, Warrington, and Dublin. In the United States the pin-making centre is Connecticut.

Pipeclay. (Fr. *Terre à pipes*, Ger. *Pfeifenerde, Weisserthon*, Sp. *Arcilla blánca.*)

A variety of fine white plastic clay, free from colouring impurities, used in the manufacture of tobacco pipes and certain classes of fine pottery. It resembles kaolin but contains a larger percentage of silica. Pipeclay is found in Devonshire, Dorsetshire, and Cornwall. It is of domestic utility for whitening leather belts and similar articles.

Pippins. (Fr. *Reinettes*, Ger. *Renetten*, Sp. *Esperiegas.*)

The name given to certain varieties of apples, of which the best known varieties are Ribston, Golden, and Newtown, all grown in America. Pippins is the name likewise applied to apples that have been dried in the sun, pressed, and stored for winter use. The Normandy pippins are a well-known example of these.

Pistachio Nuts. (Fr. *Pistaches, Pistaches casées*, Ger. *Pistazien*, Sp. *Alfónsigos.*)

The fruit of the *Pistacia vera*, a small tree of southern Europe, used, like almonds as a dessert fruit and in confectionery. From the nuts an oil is expressed which is employed in flavouring wines and cordials in Greece. The galls collected from the tree are used in dyeing and tanning. The commerce in these nuts and their products is small, and confined to Greece.

Pita. (Fr., Ger., and Sp., *Pita.*)

A hempen fibre obtained from a species of *Bromelia*, a plant of Central

America allied to the pineapple. The plant itself is sometimes known as silk grass. At present it is not easy to prepare, but it is supposed that pita will become a most valuable article of commerce if suitable machinery can be devised for separating the fibre from the plant.

Pitch. (Fr. *Poix*, Ger. *Pech*, Sp. *Pez.*)

The black, brittle, glossy solid obtained from the distillation of wood or coal tar, in which process the volatile oils are driven off. A softer pitch is obtained from bone tar and stearine residues, and this is the pitch valued by varnish and tarpaulin makers. The name pitch is given to natural asphalt, to bitumen, and also to the product of the natural lakes of Trinidad. Wood tar pitch is much used for coating ironwork to prevent oxidation, and for coating timber to protect it from the weather and the attacks of insects. That obtained from coal tar is employed in the manufacture of artificial fuel, such as briquettes. Russia and France are the chief pitch producing countries, and England imports largely from both. Burgundy pitch is the resinous exudation of a pine tree, *abies excelsa*, and is used medicinally in the preparation of stimulating plasters, and also as an irritant.

Pitchblende. (Fr. *Blende*, Ger. *Pechblende*, Sp. *Blende.*)

A brownish or velvety-black mineral of slight lustre, sometimes found in silver or lead ores. It is largely composed of protoxide of uranium, and dissolves, when powdered, in nitric acid. Its main use in the arts is for painting on porcelain. Radium is found in pitchblende, though in very small quantities.

Plantain. (Fr. *Plantain*, Ger. *Wegerich Pisang*, Sp. *Bananas.*)

The fruit of a plant, *musa paradisiaca* which belongs to the same genus as the banana. The tree is a native of the East Indies, but its cultivation is widely spread in tropical America. Unlike the banana the plantain requires cooking before it can be eaten. The imports into Great Britain are very small, as the fruit has never been held in great esteem except in warm climates.

Plaster of Paris. (Fr. *Plâtre de Paris*, Ger. *Steinmörtel*, Sp. *Argamasa hecha de cal.*)

A soft white powder, originally found in the basin of the Seine, near Paris. It can be prepared artificially from sulphate of lime by reducing the sulphate to an anhydrous state by calcination. It is extensively used for taking casts, and for various building purposes, especially internal decoration. It is also employed in the manufacture of cements and imitation marble.

Plate Glass. (Fr. *Glace*, Ger. *Spie gelglas*, Sp. *Vidrio fino, Cristal.*)

Chiefly imported into this country from Belgium. (See *Glass.*)

Plate Powder. (Fr. *Poudre à polir*, Ger. *Putzpulver*, Sp. *Polvos.*)

The ordinary plate powder is composed of a mixture of rouge, which consists of a fine oxide of iron, and prepared chalk. It is used for giving a polish to gold and silver plate or plated articles. Another kind of powder, consisting of one part of mercury and twelve parts of chalk is frequently employed on account of the brilliant appearance it lends to plate, especially silver plate. This latter compound, however, is injurious as it rapidly wears away the silver surfaces of the articles to which it is applied.

Platinum. (Fr. *Platine*, Ger. *Platin*, Sp. *Platina.*)

One of the so-called noble metals, greyish white in appearance, and generally associated in its ore with various other metals, such as iridium, osmium, palladium, rhodium, and ruthenium. The ores are now mainly obtained from the Ural Mountains, and the metal is obtained by treating the ore successively with nitric and hydrochloric acids to dissolve out the foreign substances present. With the exception of osmium, platinum is the heaviest substance known, its specific gravity being 22·48. It is not affected by exposure to the atmosphere and, like gold, it does not dissolve except in a solution of aqua regia. In addition it is hard and ductile, and these various properties render it of great value in the manufacture of chemical and electrical apparatus. It is also used for tipping gold pens, and for making fine wire which is capable of

supporting heavy weights. Latterly platinum has been applied with great success to certain processes in photography, and as the supply of the metal is somewhat limited its price has increased at an extraordinary rate.

Plum. (Fr. *Prune*, Ger. *Pflaume*, Sp. *Ciruela*,.)

The well-known fruit of various species of *prunus*, valuable as a dessert fruit, as a preserve, and also in its dried state. In addition to the plums grown at home England imports very large quantities from France, where many fine varieties of the plum tree have been cultivated, notably the Orleans, the damson, and the greengage. Elvas are imported from Portugal, and Carlsbad plums from Germany are frequently met with in the English market. The wood of the plum-tree is fine-grained and rather hard. It is useful for making musical instruments, and it is likewise employed by cabinet makers.

Plumbago. (See *Blacklead.*)

Podophyllin. (Fr. *Podophylline*, Ger. *Podophyllin*, Sp. *Podophylline.*)

The resinous extract obtained from the root-stock of the *podophyllum*, or May apple, a tree which is common in the shady woods of the United States and Canada. It is of considerable value medicinally in cases of liver complaint, but on account of its powerful action it is rarely prescribed except when combined with other medicines.

Pomegranate. (Fr. *Grenade*, Ger. *Granatapfel*, Sp. *Granada.*)

The orange-like fruit of a plant, *Punica granatum*, cultivated in the warmer temperate parts of Europe, Asia, and Africa. The pulp is sweet and cooling, but the fruit has never become popular in Great Britain, and the small demand is supplied by Portugal. The rind contains a certain amount of tannin, and is employed for tanning some of the finest kinds of leather.

Poplin. (Fr. *Popeline*, Ger. *Poplin*, Sp. *Popelin.*)

A mixed fabric, used for making ladies' dresses, consisting of a warp of silk and a weft of worsted, the latter being thicker than the former. Sometimes flax or cotton is used instead of worsted. This difference in thickness gives a corded appearance to the substance. The manufacture of poplins was introduced into Ireland by the French Huguenots, and the Irish poplins of Dublin are still much esteemed in the market. Poplins are made at Manchester in England, and at Lyons in France.

Poppy. (Fr. *Pavot*, Ger. *Mohn*; Sp. *Adormidera.*)

A genus of milky-juiced herbs, of which there are nearly twenty species, distributed through Europe, Asia, Africa, and Australia. The most important is the *papaver somniferum*, or opium poppy, from which opium is derived (see *Opium.*) In India the seeds are used as a condiment, and a bland valuable oil is also extracted from them. This oil is of a pale golden colour and serves as a fine oil for painters' colours, besides being used in the adulteration of medicinal and culinary oils in general.

Porcelain. (Fr. *Porcelaine*, Ger. *Porzellan*, Sp. *Porcelana.*)

The finest kind of china ware, made from kaolin, of a pure white colour and having a certain amount of translucency. (See *Pottery.*)

Porcupine Quills. (Fr., *Piquants de porc-épics*, Ger. *Igelstacheln*, Sp. *Picantes de erizo.*)

The thickened hair or spines of the porcupine, a species of rodent of southern Europe and northern Africa. These spines are exported from the Gold Coast, and are used for penholders and fancy work.

Pork. (Fr. *Porc*, Ger. *Schweinefleisch*, Sp. *Tocino.*)

The flesh of the pig, consisting of those parts which are not smoked and known as ham and bacon. In a pickled state it is exported in vast quantities from the great centres of the pig trade of the United States—notably Chicago. Fresh pork is imported into Great Britain from Holland and Belgium.

Porpoise. (Fr. *Marsouin*, Ger. *Meerschwein*, Sp. *Marsopa.*)

The name of a species of marine animal of the whale genus. The common porpoise is very common off the coasts of Britain and is captured for the sake of the oil supplied by its blubber, and for its skin which makes a

strong and valuable leather, used for the covering of carriages and other similar purposes.

Port. (Fr. *Porto*, Ger. *Portwein*, Sp. *Vino de Oporto.*)

A red wine produced in Portugal, and largely exported from Oporto and Lisbon. It takes some years to attain perfection, but after a certain period it deteriorates in quality. The newly-made wine varies in colour from pale rose to deep red, but after a time it becomes a deep tawny brown. It is not infrequently adulterated and coloured in order to give it the appearance required by the exporters. The most common adulterating agent is jeropiga, a mixture of elderberries, molasses, raisin-juice, and brandy.

Porter. (Fr. *Porter*, Ger. *Braunbier*, Sp. *Cerveza roja.*)

A dark-coloured liquor, made in the same manner as beer, but from an inferior kind of malt. The colour is heightened by the addition of liquorice and caramel.

Potash. (Fr. *Potasse*, Ger. *Pottasche, Kali*, Sp. *Potasa.*)

Impure carbonate of potassium obtained from the ashes of plants. Wood is frequently used for its preparation, and the ashes are boiled down until the water has evaporated. The residue is a dirty white solid. On further heating, so as to burn off the organic matter which gives the dirty colouring, a whiter product is obtained and this is known as pearl ash. Further purification gives refined pearl-ash. Both potashes and pearl ash are used to remove grease stains from fabrics, and for the manufacture of caustic potash. Large supplies of this substance are drawn from the United States and Canada. The salts of potassium, called potashes, are extremely numerous, and are used medicinally for various purposes.

Potash Water. (Fr. *Eau de potasse*, Ger. *Kaliwasser*, Sp. *Agua potasea.*)

An aerated water, often wrongly called a mineral water, which is impregnated with bicarbonate of potash before receiving the charge of carbonic acid gas.

Potassium. (Fr. *Potassium*, Ger. *Kalium*, Sp. *Potasio.*)

One of the alkaline metals. It is of a bluish white colour, has a strong metallic lustre, and when heated burns with a blue flame. Its specific gravity is ·865, and when thrown upon water it floats and abstracts the oxygen from the water, while the liberated hydrogen takes fire. It does not occur in its native state, and it is usually prepared by distilling a mixture of carbonate of potash and charcoal in an iron retort. The carbonate is obtained by burning plants in dry pits, dissolving the ashes in water, and evaporating the whole until the foreign matters, sulphates, chlorides, etc., separate in crystals, and then boiling the mother liquid to dryness in iron pots. Various preparations made from potassium are noticed under separate headings.

Potato. (Fr. *Pomme de terre*, Ger. *Kartoffel*, Sp. *Patata.*)

One of the most familiar and important of vegetables, the edible root of the plant *Solanum tuberosum*. The only valuable part of the plant is its tubers. Introduced from America, the potato has been successfully cultivated in most parts of the world, and so valuable are the nutritive properties possessed by the tubers that new kinds are being continually introduced. At the present time there are no less than 500 varieties in existence. In addition to its domestic use, the potato is largely employed as a food for cattle. Its starch can be separated from the potato with ease, by grating and washing, and this substance is prepared on a very large scale. It is chiefly used in textile factories under the name of farina, which is converted into dextrine. In Holland and in Russia large quantities of the starch are converted into sugar, and in various European countries it is passed off as a substitute for arrowroot. A spirit is also obtained from the potato and made into potato brandy. The British imports fluctuate enormously, the quantity depending upon the home supply.

Pottery. (Fr. *Poterie*, Ger. *Steinzeug, Irdene Waare*, Sp. *Alfar, Alfareria.*)

A name which includes all vessels made from earthy materials, especially clay, for use or for ornament. The varieties of pottery are very numerous according to the nature of the materials used, the peculiarities of ornamentation, the method of glazing, etc. Roughly speaking, however, a general

division may be made between hard and soft ware, the former including hard porcelain, European porcelain, biscuit porcelain and stoneware, and the latter delft, majolica, common earthenware, and terra cotta. The clays used vary greatly in fineness and purity of colour, some, like kaolin, are fire-resisting, while others, like potter's clay, are easily fusible owing to the presence of lime, oxide of iron, and other similar fluxes. The method of treatment of the clay and the general process of manufacture are noticed elsewhere.

Powder. (See *Gunpowder.*)

Precious Stones. (Fr. *Pierres précieuses*, Ger. *Edelsteine*, Sp. *Piedras preciosas.*)

These are noticed under separate headings.

Printing Ink. (Fr. *Encre d'imprimeur*, Ger. *Druckerschwärze*, Sp. *Tintá de impresor.*)

The thick composition made chiefly of lampblack and linseed oil varnish, and used by printers for inking type. (See *Ink.*)

Prunelloes. (Fr. *Prunelles*, Ger *Prunellen*, Sp. *Prunellas.*)

The name of small plums imported from France and Austria.

Prunes. (Fr. *Pruneaux*, Ger. *Pflaumen*, Sp. *Prunas.*)

The dried fruit of the Julian variety of the common plum. The fruit is dried either artificially or by simple exposure to the sun. Nearly the whole of the prunes of commerce are obtained from various districts of France, the major portion being grown chiefly in the Bordeaux district. After the Julian variety, the Brignoles, the Catherines, and the prunes d'Eute and Robe Sergent are the best known. From the orchards of the Loire the Tours prunes are obtained, and from Lorraine the variety called Quelche. Small supplies are drawn from Germany, Bosnia, and Servia. In addition to their use as dessert and for domestic purposes, prunes are of value medicinally and enter into the compound known as confection of senna.

Prussian Blue. (Fr. *Bleu de Prusse*, Ger. *Berlinerblau*, Sp. *Azul de Berlin.*)

A deep blue chemical precipitate useful for dyeing and also for tinting writing paper. It is sometimes used by laundresses. It is prepared by adding yellow prussiate of potash to a solution of green vitriol, and oxidizing the substance formed.

Prussic Acid. (Fr. *Acide prussique, Acide hydrocyanique*, Ger. *Blausäure, Cyanwasserstoffsäure*, Sp. *Acido prúsico.*)

The popular name for hydrocyanic acid. It is a compound of hydrogen, carbon, and nitrogen which combine directly, and its chemical symbol is HCN. It is usually met with in the form of a weak solution in water. Prussic acid is intensely poisonous, and has an almond flavour. It is used to some extent medicinally, but great care is required in its employment.

Pulse. (Fr. *Légume*, Ger. *Hülsenfrucht*, Sp. *Legumbres.*)

The collective name for the seeds of leguminous plants. Peas and beans are the most common and important, and after them come kidney beans, lentils, chick-peas, etc.

Pulu. (Fr., Ger., and Sp., *Pulu.*)

A brown silky substance, consisting of fine hairs, obtained from the lower portion of the stalks of the *cibotium glaucum* and other species of tree ferns found in the Sandwich Islands. It has great powers of absorption and is used on the continent as a styptic. It is also employed for stuffing pillows and furniture.

Pumice Stone. (Fr. *Ponce, Pierre ponce* Ger. *Bimstein*, Sp. *Piedra pómez.*)

A species of fibrous froth-like lava. Its composition varies, but it is largely composed of silica and alumina. Owing to its porous nature pumice floats upon water. The main supplies are obtained from the Lipari Islands, in the Mediterranean, and the colour of the stone is white or grey. A brown or black variety is exported in small quantities from the Canary Isles. Pumice stone is a hard but brittle rock. It is used for polishing wood, metal, glass, marble, lithographic stones, etc., and in preparing parchment and vellum.

Pumpkin. (Fr. *Citrouille, Courge*, Ger. *Kürbis*, Sp. *Calabaza.*)

A plant of the cucumber family, important on account of its edible fruit. It is cultivated in all temperate parts of the world. The fruit sometimes attains great dimensions, and besides

forming a common food for man it is also used as a cattle food. The seed yields an essential oil.

Purpurine. (Fr. *Purpurine*, Ger. *Purpurin*, Sp. *Purpurine.*)

One of the chief colouring matters obtained from the madder root. It is prepared by boiling madder in a strong solution of alum and then treating it with sulphuric acid. The red precipitate is afterwards dissolved in alcohol, and the purpurin crystallizes in red needles.

Purree. (Fr., Ger., and Sp., *Purree.*)

This is a yellow dye used principally in India. It is obtained from the urine of cattle which have been fed on mango leaves.

Putchuk. (Fr., Ger., and Sp., *Putchuk.*)

The root of the *Aucklandia costus*, which has an odour resembling that of the orris root. The plant is found on the mountain slopes of Cashmere and exported from Bombay, mainly to China. The root is used as an incense both in India and China.

Putty. (Fr. *Ciment, Mastic*, Ger. *Kitt*, Sp. *Cimento.*)

A plastic mixture composed of fine dry whiting or powdered chalk and linseed oil. The addition of a small quantity of white lead improves its quality. Putty is used mainly by glaziers as a cement for fixing glass window panes, and by painters in filling small holes and preparing irregular surfaces for their work. Putty is coloured by various pigments, such as ochre or lampblack. Plasterers' putty is composed of fine slaked white lime and water, the mixture being kneaded into a paste.

Putty-powder. (Fr. *Potée d'étain, Chaux d'étain*, Ger. *Zinnkalk*, Sp. *Cal de estaño.*)

The dioxide of tin, prepared from the powdered oxide which forms on the surface of melted tin. Its chemical symbol is Su O_2. This powder is used for polishing stone and glass and for giving an opague colour to the latter. It is also employed for making white enamel.

Pyrites. (Fr. *Pyrite*, Ger. *Feuerstein, Schwefelkies*, Sp. *Piedra inga.*)

The name given to the crude ores of certain metals combined with sulphur or arsenic. The most common are iron pyrites, a bronze-coloured ore, occurring in all parts of the world, the source of the manufacture of sulphuric acid and sulphate of iron. Copper pyrites is a brassy coloured mineral, extensively worked in Cornwall and Devonshire, in England, in Sweden, and in Germany. It is the chief source of copper. Tin pyrites is the steel grey mineral composed of tin, copper, and iron. It is somewhat rarely found in Cornwall. Others of importance are cobaltite and nickelite.

Pyroligneous Acid. (Fr. *Acide pyroligneux*, Ger. *Schwefelessig*, Sp. *Vinagre de madera.*)

A crude commercial form of acetic acid and sometimes known as wood vinegar. It is produced by the destructive distillation of wood, but requires to be freed from its many impurities before it is of any value. It is mainly employed in the manufacture of acetates and by dyers and calico printers. When very pure it may be substituted for vinegar in pickling.

In the manufacture of pyroligneous acid, by the destructive distillation of wood, a compound is obtained called pyroxylic spirit, or wood naphtha. It is mainly composed of methylic alcohol, and resembles alcohol in many of its properties. It is a useful solvent of resins and oils, and is valuable in the manufacture of varnishes, as well as in the preparation of cheap perfumes. Its name of wood naphtha is derived from the fact of its naphtha-like smell.

Pyroxylin.

(See *Gun Cotton.*)

Quartz. (Fr. *Quartz*, Ger. *Quarz*, Sp. *Cuarzo.*)

The general name for all minerals composed of silica. When pure it is colourless, but in most cases it is found of various colours owing to the presence of foreign matter. Three types of quartz are recognised, and of each of these there are very numerous subdivisions.

Quassia. (Fr. *Quassia*, Ger. *Quassia. Bitterholz*, Sp. *Quassia.*)

The bitter wood derived from the Jamaica ash, a spreading tree of considerable height, found in the West Indies. An infusion of the wood is much used in medicine as a powerful tonic and in cases of dyspepsia. A

wood of the same bitter character is the Surinam quassia, but it is rarely met with and not often dealt in.

Quebracho. (Fr. *Bois de quebrache*, Ger. *Quebracoholz*, Sp. *Madera de quebracho.*)

A wood derived from the *Aspidosperma quebracho*, a tree of the Argentine Republic. Its bark is valuable for its tannin and also for its medicinal properties, acting upon the system in the same manner as quinine.

Queen's Metal.

An alloy intermediate in hardness between pewter and Britannia metal. It is composed of tin, antimony, lead, and bismuth, one part of each of the last three to nine parts of the first. Its use is confined to the manufacture of the cheapest kind of spoons, jugs, pots, etc.

Quercitron. (Fr. *Ecorce de quercitron*, Ger. *Querzcitronholz*, Sp. *Corteza de quercitron.*)

The bark of the *quercus tinctoria*, a species of American oak, useful for tanning leather and also for the yellow dye which it yields. The bark is exported from the United States to Europe in considerable quantities. The timber of the tree is strong and durable, and it is sometimes used in shipbuilding.

Quicksilver.

(See *Mercury.*)

Quills. (Fr. *Plumes*, Ger. *Federposen, Federkiele*, Sp. *Cañon de pluma.*)

The modification of the hair of some animals, especially of the porcupine family, and the large feathers of certain birds, such as the swan, goose, and turkey. They are in considerable demand for penholders, tubes for artists' brushes, toothpicks, etc. Goose quills are obtained from the Baltic provinces of Russia, from Holland, and from Germany.

Quince. (Fr. *Coing*, Ger. *Quitte*, Sp. *Membrilla.*)

The yellow pear-shaped fruit of a small tree, the *Cydonia vulgaris*, of the natural order *rosaceae*, found in many parts of southern Europe. It is edible when preserved with sugar, and makes an excellent kind of marmalade, the best variety for this purpose being the quince obtained from Portugal. A wine resembling cider or perry is made from it, and the seeds afford an emollient which is used for certain hair preparations.

Quinine. (Fr. *Quinine*, Ger. *Chinin*, Sp. *Quinina.*)

The alkaloid obtained from the cinchona bark whose chemical symbol is $C_{20}\ H_{24}\ N_2\ O_2\ 3\ H_2\ O$. It is obtained from the powdered bark by treating it with lime and then extracting the mixture with alcohol. Efforts, as yet unsuccessful, have been made to prepare quinine artificially. Quinine itself is not used as a medicine, but some of its salts are, the most important being sulphate of quinine, and that is the substance which is popularly known as quinine. It is a powerful tonic, and the most useful and best known remedy in cases of malarial fever. (See *Cinchona.*)

Rabannas. (Fr., Ger., and Sp., *Rabannas.*)

A species of matting made from the fibre of the *Raphia rufea*, a small plant of Madagascar. It is almost confined, commercially, to the exports from Madagascar to Mauritius.

Rabbits. (Fr. *Lapins*, Ger. *Kaninchen*, Sp. *Conejos.*)

The well known rodent, found abundantly in Britain and in the north-west and centre of Europe. Besides the supplies obtained at home there are large quantities imported into Great Britain from Belgium. In Australia and New Zealand the rabbits have become a pest, and strenuous efforts have been made to reduce their numbers. In addition to their value as food, rabbits are commercially important on account of their skins, the hair of which is well adapted for felting purposes. The skins are chiefly used in the manufacture of felt hats and imitation furs. This trade is an extensive and growing one in England, and there is a large market for the imitation furs in the United States.

Rachat-lukumia.

A Turkish sweetmeat. It is composed of sugar and starch and is soft in character.

Racoon. (Fr., Ger., and Sp., *Coati.*)

A species of small bear, which is found only in the United States and Canada. Its skin, which is of a greyish colour, is highly valued as a fur, and is exported from North America. The animal is becoming very rare and the

supply of skins is therefore somewhat restricted.

Radish. (Fr. *Radis, Rave,* Ger. *Radies, Rettig,* Sp. *Rabanillo.*)

The well-known root eaten alone or made up into a salad. There are at least six distinct species of radish, but two forms are well marked, one having a long carrot-like root, and the other a round turnip-like root. It is grown in all parts of Europe and Asia. The oil radish is cultivated in China, and from its root an oil is expressed.

Rafia Fibre.

(See *Rabannas.*)

Rags. (Fr. *Lambeaux,* Ger. *Lumpen,* Sp. *Trapo viejo.*)

The remains of woollen and cotton clothing after they have served the purposes for which they were originally made. Rags are utilised for various purposes according to the substances from which they are derived. Linen and cotton are still much used for the manufacture of the best kinds of paper and to some extent for the production of surgical lint. Woollen rags are worked up into shoddy, and the fine fragments are dyed and then used for making flock papers for wall decorations. Great Britain imports largely from the continent and re-exports about one half of the whole she receives to the United States.

Rails. (Fr. *Rails,* Ger. *Eisenbahnschiene,* Sp. *Rall.*)

Iron and steel rails form a considerable body of British manufactures both for home consumption and for export. The cheapness of foreign production has led to increasing imports from various European countries, especially Belgium.

Raisins. (Fr. *Raisins secs,* Ger. *Rosinen,* Sp. *Pasas.*)

Dried grapes used for various purposes, such as dessert, cooking, and the manufacture of wines. The grapes are the product of certain varieties of vine grown in the Mediterranean countries. Malaga and Valencia raisins are obtained from Spain, sultana raisins, which are seedless, from Turkey, and muscatels from both countries. To prepare raisins the grapes are dried either on the vines or plucked and exposed to the heat of the sun for about a fortnight. Those intended for table use are often dipped in water upon which there is a layer of olive oil or a caustic saline solution. The smaller dried grapes of the Morea and the Ionian Islands are the currants of commerce. There is a custom's duty of 7s. per cwt. imposed upon raisins imported into Great Britain.

Rape Seed. (Fr. *Grain de colza,* Ger. *Rübsamen,* Sp. *Nabina.*)

One of the most important oil seeds of Russia and India, obtained from the *brassica rapa* and the *brassica campestris,* two plants of the same order as the cabbage. The rape, which is also known as coleseed, is now grown extensively in Britain. The rape or colza oil of commerce is obtained by crushing the seed and is used extensisively for oiling machinery and for burning in lamps. Rape cake is the residue after the oil has been extracted and forms a good feeding stuff for cattle, though it is inferior to linseed cake. When crushed the cake is a valuable manure.

Rappee. (Fr., Ger., and Sp., *Rappee.*)

A coarse variety of snuff. Its name is derived from a French word, *rape,* signfying a " grater," as that was the instrument originally used in its manufacture.

Raspberry. (Fr. *Framboise,* Ger. *Himbeere,* Sp. *Frambuesa.*)

The red fruit of the cultivated variety of the *rubus idaeus,* a plant widely distributed through Europe and Asia. The acid sweet fruit is not only used as a dessert fruit, but is made into jam, jelly, syrup, and raspberry vinegar. The last named is prepared by mixing crushed raspberries with an equal proportion of malt or wine vinegar, and allowing the whole to stand for a few days. The juice is then strained out, refined, cane sugar is added, and the product is boiled. Brandy is often added. After skimming and cooling the raspberry vinegar is bottled.

Rattans. (Fr. *Rotins, Rotangs.* Ger. *Rotange. Indianischesrohr,* Sp. *Cañas de Indies.*)

The long stems of trailing palms, species of *calamus,* sometimes known as cane palms. They are natives of the East Indies, and the slender and jointed stems are exported thence in bundles. They are used for a vast

number of purposes in the East, such as chairs, mats, hats, baskets, ropes, and even bridges. In European countries they are of value for the manufacture of cane-bottomed chairs, couches, window screens, trellised furniture, etc.

Realgar. (Fr. *Rubis de soufre*, Ger. *Roter arsenik*, Sp. *Realgar.*)

A red or orange coloured mineral, a bisulphide of arsenic, occurring in prismatic crystals in various parts of Austria Hungary. When prepared artificially it is used as a pigment.

Reindeer. (Fr. *Renne*. Ger. *Rennthier*, Sp. *Rangifero.*)

A species of deer found in the Arctic regions of Europe, Asia, and America. As a living animal it is invaluable to the natives of the districts in which it is found, and when dead its skin is used in many ways, especially for bedding and clothing, its antlers for various horn materials, and its tongue for food, particularly when tinned. Tinned reindeer tongues are exported from Russia. The flesh of the reindeer is made into pemmican.

Reindeer Moss. (Fr. *Mousse de renne*, Ger. *Rennthiermoos*, Sp. *Musco de rangifero.*)

An important lichen found in northern climes and forming a winter food for cattle. In Norway and Sweden it is also used for stuffing pillows. It is common in Britain and is employed largely for the purpose of giving the ground work to cases in which stuffed birds are preserved.

Resins. (Fr. *Résines*, Ger. *Harze*, Sp. *Resinas.*)

A class of vegetable products of great value in the arts. Some are obtained as exudations from various trees, some are found in a fossil condition, while others are extracted from various plants through the agency of alcohol. They are largely employed in the manufacture of varnishes, while medicinally they play an important part in the mixing of ointments. All the principal resins and their uses are noticed under separate headings.

Rhatany Root. (Fr. *Racine de ratanhia*, Ger. *Ratanhiawurzel*, Sp. *Corteza de ratanhia*).

The root of a shrub, *krameria triandra*, found in Bolivia and Peru. When dried it is a powerful astringent, and its medicinal properties are recognised in cases of diarrhœa. The powdered root is also used in the manufacture of various tooth powders. Almost the whole of the commercial supply is derived from Peru. Portugal imports the root for the purpose of colouring port wine a deeper red.

Rhea Fibre.

The inner fibre of the *Boehmeria nivea*, a plant of eastern Asia, used for the manufacture of China grass cloth. It is soft, silky, and strong. It is, however, little used in comparison with jute owing to the difficulty of preparation.

Rhinoceros. (Fr. *Rhinocéros*, Ger. *Rhinozeros*, *Rashorn*, Sp. *Rinoceronte.*)

A horned animal of Asia and Africa, valuable for its skin and horns, these two alone entering into commerce. The skin can be tanned, but its use is limited. The horns are made into cups, walking sticks, umbrella handles, etc. The value of the horn depends upon its size.

Rhubarb. (Fr. *Rhubarbe*, Ger. *Rhabarber*, Sp. *Ruibarbo.*)

Various species of herbaceous plants, cultivated and valued for their roots. The best comes from China, though it is called Turkey rhubarb. Its root has long been recognised as of medicinal value owing to its astringent properties. In Europe generally there are several kinds of rhubarb cultivated for the sake of their stalks, which are used for making tarts, preserves, and wine.

Ribbons. (Fr. *Rubans*, Ger. *Bänder*, Sp. *Bandas.*)

Fabrics of silk, satin, cotton, or other material used principally for trimmings. They have innumerable fancy names according to their texture and the uses to which they are applied. The centre of the ribbon manufacture in England is Coventry. France competes very strongly, and St. Etienne is the principal seat of the trade in that country. More recently Switzerland, Belgium, and Germany have applied themselves to the production of ribbons, and Great Britain draws large supplies from each of these countries.

Rice. (Fr. *Riz*, Ger. *Reis*, Sp. *Arroz.*)

The grain of the *oryza sativa*, a species of grass closely resembling barley in appearance. It is one of the

most important of human foods, being the staple of about one-third of the inhabitants of the world. It is grown extensively in all tropical and sub-tropical countries, and to some extent in Spain, Italy, and Austria. After the crop is cut, the grain is husked and quickly dried, special machinery being used for the former process. It is then ready for the market. Besides its use as a foodstuff, a wine is made from it in China and Japan, and a spirit can also be distilled from rice and molasses. Rice is sometimes used by distillers in Great Britain. It is also in great demand for the manufacture of starch, owing to its cheapness and to the fact that it contains more starch than wheat. Rice straw is employed in the manufacture of bonnets. The refuse of rice, consisting of the husk and broken grain, forms a valuable cattle food.

Rice Paper. (Fr. *Papier de riz*, Ger. *Reispapier*, Sp. *Papel de arroz.*)

A snowy white paper made in China from the layers of the pith of the *aralia papyrifera*, a plant which grows wild in the island of Formosa. It is largely used for receiving coloured drawings, for the manufacture of artificial flowers, and for making toys.

Rochelle Salt. (Fr. *Tartrate de soude et de potasse, Sel de seignette*, Ger. *Rochellsalz, Kalium-Natriumtartrat*, Sp. *Tartara de potasio y de natron.*)

Tartrate of potash and soda, prepared from cream of tartar and carbonate of soda. Its chemical symbol is $KNaC_4N_4O_6 + 4H_2O$. It is an agreeable salt and is used medicinally as a mild aperient.

Rock Salt.

(See *Salt.*)

Roots. (Fr. *Racines*, Ger. *Wurzeln*, Sp. *Raiz.*)

The principal roots, medicinal and others, are noticed under separate headings.

Rosemary. (Fr. and Ger. *Rosmarin*, Sp. *Rosnero.*)

The blue flowering tops of the *Rosmarinus officinalis*, an evergreen shrub found in most countries bordering on the Mediterranean Sea. It is cultivated chiefly for the sake of its essential oil, oil of rosemary, which is used as a stimulating ointment to promote the growth of the hair and as a perfume. It is also an important ingredient of Eau de Cologne and Hungary water. Spirit of rosemary is obtained by distilling the sprigs of rosemary with rectified spirit. It is employed medicinally to give a pleasant fragrance to plasters, ointments, and liniments.

Rose Oil. (Fr. *Huile de rose*, Ger. *Rosenöl*, Sp. *Aceite rosado.*)

The fragrant perfume obtained by the distillation of the leaves of certain roses in water. The preparation of this oil is a characteristic industry in Persia and some parts of India. (See *Otto of Roses.*)

Rosewood. (Fr. *Bois de rose*, Ger. *Rosenholz, Rhodiserholz*, Sp. *Madera de rosal.*)

A valuable fancy wood used chiefly in furniture making, and obtained from various South American trees. The best comes from Brazil, two distinct qualities being shipped from Rio de Janeiro and Bahia respectively. The timber is exported in large slabs and planks. An inferior rosewood is found in Honduras, and another species of the same wood is obtained from India. All the timber is beautifully marked and veined, and has become so popular that even the mahogany made furniture has come to be stained to imitate rosewood.

Rottenstone. (Fr. *Terre pourrie*, Ger. *Tripel, Englische erde*, Sp. *Tripol.*)

A soft siliceous stone, brown in colour, found in Derbyshire and South Wales. It is easily scraped into a powder and is used for polishing and cleaning metals and glass.

Rouge (Fr. *Rouge, Fard*, Ger. *Schminke*, Sp. *Afeite.*)

A fine dark powder, a variety of oxide of iron, used for polishing gold, silver, and speculum metal. It is obtained by heating copperas until it is completely decomposed. The artificial colouring for the skin, also called rouge, is prepared from safflower by means of citric acid or lemon juice, with the addition of French chalk. This is a harmless preparation, thereby differing from the various metallic preparations in the market.

Ruby. (Fr. *Rubis*, Ger. *Rubin*, Sp. *Rubí.*)

A pure transparent red coloured variety of corundum, highly prized as

a gem. In hardness it is inferior among gems to the diamond alone. Its composition is almost wholly of alumina. The best rubies are obtained from Burmah, and these have the colour of the blood of a pigeon. Rubies of darker colour are found in Ceylon, Siam, and China. Perfect specimens of large rubies are rarely met with, and when they exceed 4 carats in weight they are more valuable than diamonds of the same size and weight. The rubies of Burmah are sometimes known as Oriental rubies. Artificial rubies have recently been prepared by fusing a mixture of equal parts of alumina and fluoride of barium, with from two to three per cent. of bichromate of potassium. The temperature required to effect the proper fusion is very high. The artificial stones lack the brilliance and beauty of the natural gem, but they are not inferior for the purposes of watchmakers in jewelling watches.

Rue. (Fr. *Rue*, Ger. *Raute*, Sp. *Ruda.*)

An evergreen shrub, a native of southern Europe, but now extensively cultivated in many parts of the world. Its leaves yield a powerfully smelling volatile oil of acrid taste, and straw-like colour, medicinally used in the manufacture of syrup of rue, an infantile remedy. The chopped leaves make a beautiful garnish.

Rugs. (Fr. *Couvertures, Tapis de foyer*, Ger. *rauhe Decken, dicke Teppiche*, Sp. *Cubiertas.*)

Woollen fabrics used as carpets, bed coverings, wraps, etc. Besides the large quantities required for home consumption the woollen manufacturing districts of Great Britain supply millions a year to various parts of the world.

Rum. (Fr. *Rhum*, Ger. *Rum*, Sp. *Rom.*)

The distilled spirit made in countries where cane sugar is produced from the skimmings of the sugar pans. An inferior quality of rum is made from the skimmings and molasses, and a still poorer one from molasses alone. Water is added and fermentation sets in. This fermentation is allowed to proceed for several days when the mash is transferred to the still. The rum is then coloured with caramel or burnt sugar. Many different kinds of flavourings are used, one of the commonest being pine-apple. In alcoholic strength rum is about equal to brandy; when distilled it is generally 40 per cent. over proof. When well made rum improves greatly by keeping, and it is perhaps the most wholesome of all spirits. Jamaica and Demerara are the principal places of production, and Jamaica rum is the best in the market. An inferior rum is made in France from beetroot molasses, but it is an unwholesome spirit. A liqueur is made from rum, sugar, and lime juice, and is called rum shrub.

Rushes. (Fr. *Joncs*, Ger. *Binsen, Schilfe*, Sp. *Juncos.*)

The popular name for the various species of *juncus*, found in all parts of the British Isles, and imported by this country from the Continent, especally Holland. The stems are used for making chair bottoms, baskets, mats, etc. Millions of very cheap hats are also made of rushes and exported from Europe to China. The pith of certain rushes are used for making candle-wicks.

Russia Leather. (Fr. *Cuir russe*, Ger. *Russischesleder, Juchtenleder*, Sp. *Cuero de Moscovia.*)

The red dyed, tanned, heifer hides imported from Russia, used extensively for book-binding, travelling bags, cigar cases, purses, etc. The red colour is produced by a solution of alum and an extract of sandalwood, and the characteristic smell is due to the use in tanning of empyreumatic birch oil. Russia-leather is soft, pliant, and beautifully grained. It is not affected by damp and its smell saves it from being attacked by insects. There is much imitation leather made in England and France, where the skins of sheep and goats are used instead of those of heifers.

(See *Leather.*)

Rye. (Fr. *Seigle*, Ger. *Roggen*, Sp. *Centeno.*)

The edible grain of various grasses allied to wheat and barley, the commonest being *secale cereale.* It is grown extensively in most parts of the continent, rye bread being a commoner food of the peasantry abroad than wheaten bread. In England it is grown only as fodder for cattle. Besides its use for making

bread rye is cultivated for distillation, the spirit called Hollands being made from it. A good beer is obtained from the malted grain. The straw is useful for thatching and straw plaiting.

Sable. (Fr. *Martre zibeline*, Ger. *Zobel, Zobelthier*, Sp. *Marta cebellina.*)

A mammal of the weasel family, from which is derived the most valuable of all furs. The American or Hudson's Bay sable fur is the skin of the *Mustela Americana*. The fur is generally brown with greyish-spots scattered here and there. The skin of the animal is most valuable if taken in the early part of the winter, and in order that it may be obtained as perfect as possible the animal is captured by means of traps. In addition to the supplies obtained by Great Britian from America, there are considerable imports to this country from Russia and Siberia. The fur is used for making cloaks, muffs, boas, linings, etc.

Saccharin. (Fr. *Saccharine*, Ger. *Saccharin, Fruchtzucker*, Sp. *Sacharine.*)

A white semi-crystalline powder of intense sweetness, prepared by complex processes from coal-tar. Its chemical symbol is $C_6H_4COSO_2NH$. Owing to various circumstances saccharin, or as it is sometimes called glucide, has not yet become a formidable competitor of sugar for domestic use, but it is employed medicinally in the mixing of drugs and also for sweetening the food of patients suffering from diabetes. It is also sometimes introduced into aerated waters.

Safes. (Fr. *Coffres forts*, Ger. *Eiserne Schränke*, Sp. *Armarios.*)

Repositories for the preservation and protection of valuable goods or documents from thieves and fire. For the former purposes the joints require to be of great strength, the door strongly hinged, and the locks of such construction that bolts secure the door all round the edges. To resist fire a special compound is placed between the iron plates which together constitute the wall of the safe. The compound originally used was charcoal steeped in an alkaline solution; but now it is generally composed of equal portions of pounded alum and gyptum. Another useful mixture is composed of two parts of alum, and one part each of clay and pounded marble.

Safflower. (Fr. *Safran batarde*, Ger. *Safflor*, Sp. *Azafran rumi.*)

Also called bastard saffron. It is a herb extensively cultivated in India, Persia, and other parts of the East, and valuable for the red dye carthamine, which is obtained from its flowers by treating them with an alkaline solution. Its principal use is for dyeing silk and cotton, and for colouring toilet rouge. Its importance as a dyestuff has diminished rapidly since the introduction of coal tar colours.

Saffron. (Fr. and Ger. *Safran*, Sp. *Azafran.*)

The dried stigmata of the flowers of the *crocus sativus*, a plant widely cultivated in Mediterranean countries. It is imported into England for culinary purposes, and also for medical use as a slight stimulant. In India its use is extensive. The best quality of saffron is obtained from Valencia. Owing to its high price saffron is very frequently adulterated.

Sage. (Fr. *Sauge*, Ger. *Salbei*, Sp. *Salvia.*)

A culinary herb much used for seasoning. There are many species cultivated, but the best known and the most common is the *Salvia officinalis*, found in most parts of Europe. It is powerfully aromatic in odour and bitter in taste. The leaves and flowers when infused in tea are considered tonic and astringent. An essential oil obtained from the plant is sometimes used in the manufacture of liniments which are useful in cases of rheumatism.

Sago. (Fr. *Sagou*, Ger. *Sago*, Sp. *Sagú.*)

A farinaceous substance of great nutritive power obtained from the pith of various species of palms, the principal of which are the *Sagus rumphii*, the *Sagus laevis*, and the *Caryota urens*. This substance is obtained almost exclusively from the East Indies. The trees are felled, the stems cut into sections, split open, and the pith removed. The pith is then beaten in water to separate the starch granules from the fibre, and afterwards dried in the sun. The result is sago flour, the raw material used in the preparation of all other

kinds of sago. Sago is made in France from potato starch. It is much inferior to real sago, and the difference between the two can be easily detected.

Sal. (Fr., Ger., and Sp., *Sal.*)

The timber of a tree of northern India, the *Shorea robusta*. It is hard, dark brown, coarse grained, and very durable, though somewhat less so than teak. Its cultivation is cared for by the government. The wood is used for making bridges, gun carriages, railway sleepers, etc. From the bark a resin exudes which is used as a substitute for dammar.

Sal Ammoniac. (Fr. *Hydrochlorate ou muriate d'ammoniaque*, Ger. *Salmiak*, Sp. *Sal amoniaco.*)

The hydrochlorate or muriate of ammonia of extensive use in chemistry and medicine. It is generally prepared from the ammoniacal liquor of gas works by the addition of hydrochloric acid and subliming it in iron pots. It may also be made by mixing a solution of ammonia with hydrochloric acid. It is met with in crystalline masses, or as a powder, and is used for soldering and for cleaning the surfaces of metals.

Sal Volatile. (Fr. *Sel volatil d'ammoniaque*, Ger. *Kohlensaures ammonium*, Sp. *Amonio carbónico.*)

A solution of carbonate of ammonium mixed with ammonia and dilute alcohol. Very commonly oil of nutmeg or oil of lemon is added, sometimes both. It is a strongly caustic liquid, and should never be used unless well diluted. It is the common smelling salts of commerce.

Salicin. (Fr. *Salicine*, Ger. *Salicin*, Sp. *Salicina.*)

A white crystalline powder composed of carbon, hydrogen, and oxygen, of which the chemical symbol is $C_{13}H_{18}O_7$. It is obtained from the bark of several species of poplar and willow. It is much used medicinally as a substitute for quinine, and also to adulterate that substance.

Salicylic Acid. (Fr. *Acide salicylique*, Ger. *Salicylsäure*, Sp. *Acido salicino.*)

An organic acid, whose chemical symbol is $C_7H_6O_3$, originally prepared from salicin, but now generally obtained by heating sodium phenate in a current of carbonic acid gas. It is a white crystalline solid with a sweet taste and dissolves readily in hot water. It is a valuable antiseptic, being three times as powerful as carbolic acid. Taken internally as a medicine, it is of the greatest value in cases of acute rheumatism.

Salmon. (Fr. *Saumon*, Ger. *Lachs, Salm*, Sp. *Salmon.*)

The choice river fish caught extensively in various parts of the British Isles, and imported into this country fresh from Norway and Iceland. The fish is cured in Scotland. Large supplies are obtained from British Columbia, where the salmon are preserved and tinned and then exported to all parts of the world.

Sal Prunellae. (Fr. *Azotate de potasse fondu*, Ger. *Salpeter-zeltchen*, Sp. *Tienda pequeña de nitro.*)

Nitrate of potash, purified in mass, or fused into circular cakes or small balls. It is used for various chemical purposes and also for the preparation of gunpowder.

Salsify. (Fr., Ger., and Sp., *Salsifis.*)

A purple flowered herb common throughout Europe and Asia. It is chiefly cultivated on account of its sweet edible roots, which are cooked like carrots or parsnips, and make a delightful vegetable. When prepared in a particular way, especially in America, the roots have the flavour of oysters, and for this reason salsafy is sometimes known in popular language as the oyster plant.

Salt. (Fr. *Sel*, Ger. *Salz*, Sp. *Sal.*)

The universal condiment, generally known as common salt, to distinguish it from the large body of other substances known to chemists as salts. Its chemical symbol is NaCl, and its proper name is chloride of sodium, chlorine and sodium being its constituent parts. Salt occurs in sea-water and the supplies of some countries are still largely obtained by the evaporation of sea-water. For others the great natural beds of salt found in many parts are better and more serviceable. The largest deposits of rock salt are found in the mines of Wieliczka, in Galicia. This rock salt is of a brownish colour owing to the presence of a small quantity of peroxide of iron, and requires treatment before it is fitted for general use. In England

enormous supplies are obtained from the brine springs of Cheshire. The brine is pumped up and evaporated. If the brine is boiled down quickly the salt separates into small crystals and forms the best table salt. By slow boiling large crystals are formed, and the coarse grained salt is obtained which is most suitable for curing. Bay salt is the name of the salt evaporated from sea-water. Salt has a specific gravity of 2·15. Besides its common domestic uses, salt is of the utmost importance in the manufacture of soda, hydrochloric acid, and soap. It is also much employed for filling the pipes of freezing machines.

Salt, Spirits of.

(See *Hydrochloric acid.*)

Salt Cake. (Fr. *Sulfate de soude*, Ger. *Natrium-sulfat*, Sp. *Sulfato de natron.*)

An impure sulphate of soda, also known as nitre cake.

Saltpetre. (See *Nitre.*)

Sandalwood. (Fr. *Sandal, Santal*, Ger. *Sandelholz*, Sp. *Sándalo.*)

The odoriferous wood obtained from several species of the *santalum*, a tree of India and the East Indies. The timber is close and fine-grained, and is held in much esteem by cabinet makers, carvers, and engravers. Owing to its peculiar smell it is proof against the ravages of insects. The wood is burned in India as an incense. From the roots of the plant sandalwood oil is distilled, the best being made in England and France from the roots which are imported into Europe from India. This oil is extensively used in the manufacture of many perfumes, and also of varnishes which give a sandal odour to various woods which are sold as sandal wood. One species of santalum produces a dye stuff which gives different colours to the article dyed according to the mordant employed.

Sandarach. (Fr. *Sandaraque*, Ger. *Sandarak, Sandarach*, Sp. *Sandaraca.*)

A yellowish inflammable resin obtained by exudation from a certain cone-bearing tree of the north of Africa, principally Morocco. It resembles mastic in appearance and some of its properties, and is used for the preparation of French polish. The timber of the tree is hard, compact, and durable, and is used, though in small quantities, for furniture and cabinet making.

Sappan Wood. (Fr. *Sapan*, Ger. *Sapanholz*, Sp. *Sapan.*)

The wood of the *Caesalpinia sappan*, a large tree of southern India and Bengal. A red dye is obtained from this wood which is largely used in calico printing.

Sapphire. (Fr. and Ger. *Saphir*, Sp. *Zafiro.*)

A transparent variety of corundum, highly prized as a gem. Although found of different colours blue is the prevailing hue. The sapphire is composed of almost pure alumina, and its colour is due to the presence of small quantities of foreign matter. It is nearly as hard as the diamond. The finest sapphires are found in Ceylon and Burmah. Inferior ones are obtained in Australia and the United States, whilst those of Bohemia are of little or no value. The value of the gem depends entirely upon its quality and not upon its size as is the case with the diamond and the ruby. Quite recently artificial sapphires have been produced by heating fusible aluminates in the presence of silica at a very high temperature.

Sapucaia Nuts.

The edible seeds of the urn-shaped fruit of the *Lecythis Zabucajo*, a tree very common in the forests of the north of Brazil. The fruit is often as large as a human head, and when the lid is taken off the seeds or nuts are found packed much in the same fashion as Brazil nuts. They are oval in shape and slightly pointed at each end. The quality of the nuts is much finer than that of the Brazil nuts, and a valuable oil can be extracted from them. They are exported almost exclusively from Para. In England they are commonly known as monkey nuts.

Sardine. (Fr. *Sardine*, Ger. *Sardelle*, Sp. *Sardina.*)

A small fish very plentiful off the coasts of France and Spain, deriving its name from the island of Sardinia. It is of the same genus as the pilchard. In France an enormous trade is done in curing the fish in the finest olive oil and tinning them. The pilchard is similarly treated in Cornwall. Large quantities of the so-called French sardines are really sprats.

Sarsaparilla. (Fr. *Salsepareille*, Ger. *Sarsaparilla*, Sp. *Zarzaparrilla.*)

The dried roots of several species of *smilax*, a shrub of Central and Southern America. There are two special varieties obtained from Jamaica and Lima respectively. The roots are very long, of the thickness of a quill, dark brown in colour, and bitter in taste. Various decoctions made from the roots are medicinally used as tonics and diuretics, and derive their properties from the presence of starch, resin, a volatile oil, and the crystalline principle smilacine.

Sassafras. (Fr. *Sassafras*, Ger. *Sassafras*, Sp. *Sasafraz.*)

A species of laurel widely spread over the United States and Canada. The wood, the bark, and the root are of great medicinal value, especially in cases of skin diseases and rheumatic affections. Instead of the wood, bark, or root, the volatile oil, called oil of sassafras, which is extracted from the root, is used. A dye of considerable value is likewise extracted from the wood.

Satin. (Fr. *Satin*, Ger. *Satin, Halbatlas*, Sp. *Raso de filoseda.*)

A well-known fabric composed of closely woven silk, sometimes dressed with gum, having a beautifully smooth shining surface. This smooth shining surface is due to the fact that for each shot of the weft only the fifth, sixth, seventh, eighth, or even tenth thread is raised. Satins are known in the market by different names according to the method of manufacture. The best are manufactured at Lyons, but much satin is now made in England. Its principal uses are for making dresses and ribbons. Inferior kinds are called satinet, and fabrics made of cotton and wool, woven in the same manner as the silk fabric, are known as sateen.

Satin Wood. (Fr. *Bois de satin*, Ger. *Atlasholz*, Sp. *Madera de águila.*)

The yellow coloured wood obtained from two different species of trees, one found in Southern India, the other in the West Indies. When polished it possesses a lustre like that of satin. It is used in the manufacture of certain kinds of furniture, for panelling the cabins of passenger steamers for inlaying, and for the manufacture of picture frames, the backs of toilet brushes, and other ornamental articles.

Sausages. (Fr. *Saucisses*, Ger. *Würste*, Sp. *Morcillas.*)

Various kinds of chopped meats, mixed with flour or bread and spices, and packed in inflated gut skins. The skins are largely imported from Australia. There are extensive exports of sausages from Germany and also from Bologna in Italy. Owing to the vast amount of adulteration and to the use of unsound meat in their manufacture, poisoning is of no rare occurrence from indulgence in this class of food.

Sauterne. (Fr., Ger., and Sp., *Sauterne.*)

A French white wine produced in the district of the Gironde, made from a species of over-ripe grape. The best brand is that of the Château Yquem, and this wine is one of the finest and purest produced in France.

Savin. (Fr. *Sabine*, Ger. *Säbenbaum*, Sp. *Sabina.*)

The oil obtained from the fruit of a species of juniper, *Juniperus sabina*, a tree found in Italy and in some parts of the United States. It is used in the form of an ointment for keeping up discharges from blistered surfaces. Owing to its poisonous nature its internal medicinal employment requires the utmost care.

Savoy. (Fr. *Chou de savoie*, Ger. *Savoyerkohl, Wirsching*, Sp. *Berza, Col.*)

The well known winter cabbage, resembling the common cabbage in every respect except that it has wrinkled leaves.

Sawdust. (Fr. *Sciure*, Ger. *Sägespäne*, Sp. *Aserraduras.*)

The waste of wood when cut or sawn. Besides its use for sprinkling floors, stuffing dolls and cushions, and packing goods, sawdust is commercially valuable in the manufacture of oxalic acid, packing for fire proof safes, and soda ash. Mahogany sawdust is used for smoking fish, and that of boxwood is employed by jewellers for drying washed articles. When sawdust is mixed with tar it can be made into a kind of fuel like briquettes.

Scammony. (Fr. *Scammonée*, Ger. *Scammonienhurz*, Sp. *Escamonéa.*)

The grey gum resin obtained from the root of the *Convolvulus scammonia*,

a wild plant of Asia Minor. The root is cut and the juice at once flows out, quickly hardening on exposure to the atmosphere. It has a smell resembling that of cheese. The best scammony is obtained from Aleppo, that of Smyrna being of a very inferior quality. Its use is entirely medicinal, scammony mixture forming an excellent purgative for young children.

Scrap. (Fr. *Fer de rebut*, Ger. *Altеisen*, Sp. *Hierro viejo.*)

Waste old iron. It is bought up for the purpose of re-melting. Thousands of tons are annually exported from England for re-manufacture.

Screws. (Fr. *Vis*, Ger. *Schrauben*, Sp. *Tornillos.*)

These well-known articles are now made entirely by machines of ingenious construction. They are of metal or wood. The centre of the manufacture in England is Birmingham.

Seal. (Fr. *Phoque*, Ger. *Seehund*, Sp. *Can marino*)

The name commonly applied to all species of Pinnipedia except the walrus. They are found in the seas of the Arctic and north temperate regions of Europe, Asia, and America, and are valuable for their furs and for the oil taken from them. The greatest supplies are obtained from the Behring Strait, Greenland, and Newfoundland. The taking of seals in Behring Strait has been restricted by agreement between Great Britain and the United States, and the price of seal skins has consequently risen.

Sealing Wax. (Fr *Cire à cacheter*, Ger *Siegellack*, Sp *Lacre.*)

A composition used for securely fastening letters and attaching impressions. The best red sealing wax consists of a mixture of shellac, Venice turpentine and vermilion, to which are added small quantities of magnesia and chalk. The whole are mixed together at a good heat, stirred quickly, and when sufficiently mingled poured into moulds. The inferior substance contains less shellac and vermilion, whilst bottle wax is often composed of pine-resin, turpentine, and chalk, together with some colouring matter. For making the various coloured sealing waxes different substances are used; lamp black for black, amber for brown, ultramarine for blue, chrome yellow for green, and ochre for yellow. Quite recently it has been found that the colouring can be produced by means of the aniline dyes.

Seidlitz Powders. (Fr. *Poudres de Seidlitz*, Ger. *Seidlitzpulver* Sp. *Polvos de Seidlitz*)

A common aperient sold by chemists. They are composed of bicarbonate of soda and tartrate of potash, one part of the former to three of the latter, mixed in the form of a powder, and powdered tartaric acid in quantity equal to the bicarbonate of soda. The first two ingredients are made up and sold in a different packet from the last. When taken the first are dissolved in water, and the tartaric acid added to produce effervescence. The name is derived from Seidlitz, a town in Bohemia, where there is a natural spring of water containing the same elements.

Seltzer. (Fr *Eau de seltz*, Ger. *Seltzerwasser*, Sp. *Seltzer.*)

The natural effervescing seltzer water is obtained from the springs at Nieder-Selters, in Nassau. According to one analysis the water contains a large number of substances in solution, but the principal are bicarbonate of soda, common salt, and carbonic acid gas. It is a mild stimulant, and is largely used as a table water. It is estimated that more than three million bottles are annually exported to all parts of the world. The artificial seltzer water is extensively manufactured, and consists of the principal ingredients of the natural water.

Semolina. (Fr. *Semoline*, Ger. *Weizengries*, Sp. *Semola.*)

The grains of hard wheat which are not ground into flour in the process of milling, and purposely left in that state by the arrangement of the mill stones. Semolina is produced in Italy and the substance is almost exclusively obtained from that country. Owing to the fact that there is a greater amount of gluten in hard wheats than in soft ones, semolina is highly nutritious, and is much used for making puddings and soups.

Senega Root. (Fr. *Sénéga, Racine de polygala de Virginie*, Ger. *Senegawurzel, Kreuzblumenwurzel*, Sp. *Raiz de glance.*)

The dried root of a small herb, *Polygala senega*, found in the United States.

It is popularly known in America as the snake root. Medicinally it is of value in cases of bronchitis and affections of the lungs.

Senna. (Fr. *Séné*, Ger. *Sennesblätter*, Sp. *Sen.*)

A drug of much medicinal value consisting of the dried leaflets of several species of *cassia*. There are two principal varieties, the Alexandrian, chiefly grown in Egypt, and the Tinnivelly, obtained from the East Indies. It is taken either as an infusion, a syrup, or a tincture. From 5,000 to 10,000 bales of senna leaves are annually imported into Great Britain from Alexandria.

Sepia. (Fr. Ger. and Sp. *Sépia.*)

A brown pigment prepared from the ink-bag of a species of cuttle fish found in the Mediterranean. It is much used as a water colour, and it is also employed by draughtsmen in the preparation of plans and drawings.

Serge. (Fr. *Serge*, Ger. *Sarsche*, Sp. *Sarga.*)

A rough variety of twilled cloth made from worsted. It has a wide range of quality, and is generally dyed black or dark blue.

Sesame. (Fr. *Sésame*, Ger. *Sesam*, Sp. *Sésamo.*)

The herb of the genus *Sesamum*, commonly cultivated throughout the East on account of its seeds, which produce gingeli oil, a pale, straw-coloured, sweet oil which is used for perfumery and also as a substitute for olive oil. Both the seeds and the oil are extensively imported into Europe.

Seville Oranges.

(See *Oranges.*)

Shabrack. (Fr. *Couverture à cheval*, Ger. *Schabracke*, Sp. *Mantilla.*)

The covering for cavalry saddles, made from cloth or from sheep-skins with short curly wool.

Shaddock. (Fr. *Pomplemousse*, Ger. *Shaddock*, Sp. *Shaddock.*)

A tree of the citron order, a native of the East Indies, but introduced and cultivated in southern Europe and in the West Indies. The name is derived from Captain Shaddock, who was responsible for its introduction from China to the West Indies in the early part of the nineteenth century. The fruit is large, sometimes weighing as much as twenty pounds, and bright yellow in colour. The rind is thick and the pulp watery and acid. It is a pleasant cooling fruit and makes an excellent preserve. A finer and smaller shaddock, called pomelo, is grown in Florida and in India.

Shagreen. (Fr. *Peau de chagrin*, Ger. *Chagrin*, Sp. *Zapa.*)

A kind of parchment or leather prepared from the skins of horses and asses. It has a granular appearance and green colour, the former being due to the pressure of seeds into the leather before drying, and the latter to the process of dyeing with oxychloride of copper. It is much used for covering cigar cases, cabinets, small boxes, and similar ornamental articles. The name is also applied to the prepared skins of sharks, rays, and various other fish.

Shale. (Fr. *Argile schisteuse*, Ger. *Schieferthon, Bandschiefer*, Sp. *Arcilla de pizarra.*)

The rock resulting from stratified and hardened mud and clay. It is composed of alumina and silica, and is coloured by oxide of iron. It is obtained in various parts of England and Scotland, and is commercially valuable for the production of paraffin. Another product obtained from certain shales of Lancashire, Yorkshire, and Lanarkshire, through which sulphuret of iron is disseminated, is alum.

Shawls. (Fr. *Châles*, Ger. *Shawls, Umschagtücher*, Sp. *Chals.*)

Wraps, chiefly made of wool, worn in all parts of the world. Those obtained from the East have always been held in great esteem, especially the shawls of Cashmere, made from the soft inner wool of the Tibet goat. No finer fabric is produced than this material, and the dyes used in the manufacture of the shawls are the native colours, aniline dyes being practically prohibited. Imitation Cashmere shawls are made at Lyons and Vienna. There imported Tibet wool is used. Common shawls, plain and chequered, are made in various parts of England and Scotland, where the woollen trade is carried on. In the United States the centre of the shawl trade is Massachusetts. Silk and crape shawls, made in imitation of Chinese work, are manufactured at Norwich; grenadines and chenilles at Lyons.

Shea Butter. (Fr. *Suif de noungon*, Ger. *Sheabutter*, Sp. *Oleo de galam.*)

A greenish coloured oil, of the consistence of tallow, obtained from the seeds of the *Butyrospermum parkii*, a tree of West Africa. The oil consists of stearin and olein, 70 per cent. of the former and 30 per cent. of the latter. Besides acting as a food for the natives of West Africa, it is exported to Europe, chiefly from Sierra Leone, to be used in soap making.

Sheep. (Fr. *Mouton*, Ger. *Schaf*, Sp. *Oveja.*)

The domestic animal, of which there are about twelve species, valued for the food and the wool obtained from it. Owing to the rapid consumption within the British Isles, the number of sheep has lessened considerably during the last thirty years, and living sheep are now imported from the Continent. Fresh mutton is also sent from the continent and frozen mutton comes from Australia and New Zealand. The chief supplies of wool derived from sheep comes from Australia. Merino wool comes from Spain. Sheep skins for leather making, to the extent of about fifteen millions a year, are obtained from South Africa and Australia.

Sheet Glass.

(See *Glass.*)

Shellac.

(See *Lac.*)

Sherry. (Fr. *Vin de Xérès*, Ger, *Xereswein*, Sp. *Vino de Jerez.*)

The general name for the better sort of white wines produced in the neighbourhood of Xeres, near Cadiz, the finest vineyards being situated at Xeres de la Frontera. Pure sherry is a pale, thin, dry wine, the principal varieties being Vino Fino, Amontillado, Manzanilla, and Montilla. The best wines are kept at Cadiz in order to be added to inferior wines and so improve their quality. Before exportation all herry is strengthened by the addition of brandy or alcohol. The exports from Cadiz are mainly to England, but the trade has declined considerably during the last thirty years.

Shingles. (Fr. *Bardeaux*, Ger. *Dachschindeln*, Sp. *Tablillas.*)

Flat pieces of wood, generally oak or pine, cut by machinery and used for roofing like slates or tiles. They are not much used in England, and there is comparatively no international commerce in these things.

Shoddy. (Fr., Ger., and Sp., *Shoddy.*)

A material produced in Yorkshire and Lancashire and largely used in the manufacture of cloth. The chief centres of the trade are Batley, Dewsbury, and Leeds. It is made of the wool obtained from worn and ragged woollen goods, with the addition of a certain amount of fresh wool. The rags are torn, separated, and cleaned by machinery, and the fabric made from the short wool is re-manufactured into rugs, friezes, flannels, inferior cloths, etc. The trade has grown to enormous proportions owing to the demand for woollen cloths, and though shoddy has not the durability of new wool it is serviceable while it lasts.

Shola. (Fr., Ger., and Sp., *Shola.*)

The white pith of an Indian plant, *Œschynomene aspera*, which is a bad conductor of heat and much used in the manufacture of the helmets worn by the British in India. The substance is also employed for making fans, toys, etc.

Silk. (Fr. *Soie*, Ger. *Seide*, Sp. *Seda.*)

The fibre on the cocoon of the silkworm, chiefly the bombyx mori. It is the strongest, most lustrous, and most valuable of all textile fabrics. The climate of England is not favourable to the cultivation of the silkworm. Consequently the manufacture of silk and of silk goods is mainly carried on abroad, the principal countries manufacturing in Europe being France, Belgium, and Holland. Silk goods are imported into this country in various forms, as broad stuffs, ribbons, laces, etc.

Silkworm Gut. (Fr. *Boyau de ver à soie*, Ger. *Seidenwurmdarm*, Sp. *Tripa de gustano de seda.*)

A very strong material used by anglers for dressing the hook-ends of fishing lines. It is prepared from the caterpillars of the ordinary silkworm. The worms, when about to spin their cocoons, are immersed in vinegar for a considerable period and afterwards pulled asunder. A long glutinous thread is then formed by the silky secretion of the caterpillar. These threads are stretched on a board and allowed to

dry in the sun. This gut is mostly prepared in Spain and Italy, though some exports are still made from China.

Silver. (Fr. *Argent*, Ger. *Silber*. Sp. *Plata.*)

The beautiful hard white metal which has been held in highest esteem from the earliest times. It is sometimes found in a free state, but frequently compounded with other elements, as with chlorine to form horn silver, and with sulphur to form silver glance. It exists in small quantities in samples of galena, and the most productive of the ores obtained in the British Isles are found in the Isle of Man. In Europe, silver is found in Spain, Austria, and Germany, but the discoveries of the rich deposits of the New World, from the United States to Chili, have led to the neglect of the European mines. The specific gravity of silver is 10·5. With the exception of steel it is not exceeded by any other metal in brilliancy of lustre. In hardness it is intermediate between gold and copper. Malleable and ductile, it can be beaten into extremely thin leaves, and drawn into very fine wire possessing great tenacity. Silver is the best known conductor of heat and electricity, and in consequence it is much employed in the manufacture of delicate electrical instruments and machines.

Simaruba. (Fr. *Écorce de simarube*, Ger. *Simarubarinde*, Sp. *Simaruba.*)

The root bark of the *Simaruba amara*, a tree found in various parts of the tropics in Asia, Africa, and America. It has a characteristic bitter taste. The bark is often used as a substitute for quassia, and known as such. It is of medicinal value in cases of dysentery, and is also employed as a tonic.

Sisal Hemp. (Fr. *Chanvre d'Amerique*, Ger. *Amerikonerhanf*, Sp. *Cañamo de America.*)

The fibre obtained from the *Agave rigida*, a plant of Mexico. At one time this fibre, compressed into bales, was largely imported into Great Britain. The greater portion, however, is now sent to the United States. The best is obtained from Yucatan. The fibre is strong and glossy, and admirably adapted for rope making on account of its damp resisting properties.

Sissoo Wood. (Fr. *Bois de rose*, Ger. *Rosenholz*, Sp. *Madera de rosa.*)

The timber derived from the *Dalbergia sissoo*, a tree of the rosewood type found in India. The wood is hard and durable, and does not split or warp. It is valuable, like other kinds of rosewood, for the manufacture of furniture.

Size. Fr. *Colle forte*, Ger. *Leim*, Sp. *Cola.*)

A species of glue or varnish used by house-painters, papermakers, gilders, etc. It is variously composed of linseed oil, red lead, vermillion, etc., mixed with turpentine.

Skins. (Fr. *Peaux*, Ger. *Felle, Häute*, Sp. *Piel.*)

The coverings of animals. The name is generally applied to the coverings of the smaller animals, those of the larger ones being known as hides. The principal skins found in commerce are noticed under separate headings.

Skunk.

A species of animal belonging to the weasel family, found in many parts of the United States. Its skin is of high commercial value, and is often passed off as Alaska sable.

Slag. (Fr. *Scorie*, Ger. *Schlacke*, Sp. *Escoria.*)

The refuse obtained from smelting works, glass foundries, etc., composed of very different elements according to its origin. At one time all slag was waste, but it is now utilised for a great number of purposes. By the action of steam it is made into silicate cotton, a substance which is a bad conductor of heat and sound, and therefore useful for covering boilers and filling up the spaces between adjoining rooms. It is sometimes cast into blocks of the size of bricks and used for building and paving purposes. The slag obtained from the smelting of Cleveland pig-iron contains a large amount of phosphoric acid and forms a valuable manure.

Slate. (Fr. *Schiste*, Ger. *Schiefer*, Sp. *Pizarra.*)

A hard clay-like rock which splits up into thin sheets. It is of various colours, gray, blue, green, purple, or black, and a red slate is found in the province of Quebec. The chief supplies of slate are obtained from Wales, the Lake District, and various parts of Scotland. The large slabs of slate

are used for making billiard tables, and the thin ones are employed for roofing purposes and in the manufacture of the common writing slate. Mantelpieces and architectural panels are made of enamelled slate. Various trade names are given to roofing slates according to their sizes:—"Ladies," 15 inches × 8 inches; "viscountesses," 18 × 10; "countesses," 20 × 10; "duchesses," 24 × 12; "princesses," 24 × 14; and "queens," 36 × 24. Slate pencils are thin cylinders of slate used for writing purposes. They are made out of soft slate by cutting or turning, or by pressing moist slate powder until it is firm.

Smalt. (Fr. *Smalte, Bleu d'azur*, Ger. *Schmalte*, Sp. *Esmalte.*)

A metallic powder, blue oxide of cobalt melted with carbonate of potassium and sand, which is really pulverized glass. It is used in the manufacture of blue glass, in the colouring of porcelain and earthenware, and in tinting paperhangings, linen, calico, etc. The greater portion of the smalt used in England comes from Holland and Germany.

Snuff. (Fr. *Tabac, Tabac à priser*, Ger. *Schnupftabak*, Sp. *Tabaco de polvo.*)

A powdered preparation of tobacco, made by grinding the chopped leaves and stalks of tobacco in which a certain amount of fermentation has been set up by moisture and warmth. It is variously flavoured and fanciful names are given according to the place and method of manufacture. The snuff consumed in Great Britain is almost entirely home made, the imports from France and Brazil being insignificant in amount.

Soap. (Fr. *Savon*, Ger. *Seifen*, Sp. *Jabon.*)

The chemical meaning of soap is much wider than the commercial one. The former includes all combinations of fats or fatty acids with alkaline or metallic salts; the latter is confined to compounds containing potash and soda only. There are two great divisions of soap—hard and soft. Hard soap is often known as soda soap, while soft soap is potash soap. The principal fats and oils used for the manufacture of hard soap are tallow, greases, palm-oil, lard, cocoanut oil, and olive oil. The chief ingredients used in the manufacture of soft soap are linseed oil, castor oil, and various fish oils. In the process of manufacture the oils used are boiled in a pan and a solution of caustic soda or potash added. The boiling is continued and oils and the solution are alternately added until the pan is filled. Salt to the extent of ten per cent. of the fatty matter is added, the effect being that the soap is rendered insoluble in the salted liquid and rises to the surface. The liquid is drawn off and the soap is cast into moulds. For the manufacture of particular soaps there are many intricate processes, some of which are patented, and fancy and scented soaps are made by the addition of various dyes and perfumes.

Soapstone.

(See *Steatite.*)

Soapwort. (Fr. *Saponaire, Racine de savonnière*, Ger. *Seifenwurzel*, Sp. *Saponaria.*)

The root of the *Saponaria officinalis*, a herb of Asia Minor, though sometimes found in various parts of Europe. It contains a gum and a resin, and the leaves of the plant produce a lather in water like that of soap, and the liquid is used for washing silk and wool, which it thoroughly cleanses, and to which it adds a beautiful lustre. It is sometimes employed medicinally as an aperient.

Soda Ash. (Fr. *Soude, Carbonate de soude*, Ger. *Kohlensaures Natrium*, Sp. *Carbonate de natron.*)

The commercial form of carbonate of sodium, one of the most useful of chemical products. It was formerly obtained almost entirely from seaweed. Now it is made from common salt by two distinct methods. In the first, known as the Leblanc process, salt is heated with sulphuric acid and a salt cake is formed. This cake is decomposed by charcoal and lime with the result that black ash is produced. The black ash, when cold, is treated with water, boiled down to dryness, and the residue roasted. Soda ash is then formed. The other method, known as the Solvay process, consists in dissolving common salt in a solution of ammonia and passing a current of carbonic acid gas into the liquid, when bicarbonate of sodium is precipitated

in the form of white crystals. These are collected and heated, the carbonic acid gas and water are given off, and the carbonate of sodium remains. Hundreds of thousands of tons are made annually for use in soap making, glass manufacture, and bleaching.

Soda, Bicarbonate of. (Fr. *Bicarbonate de soude*, Ger. *Doppelt kohlensaures natrium*, Sp. *Bicarbonate de natron.*)

Commonly known as baking powder. Its chemical symbol is $2NaHCO_3$. It is prepared by the passage of a current of carbonic acid gas over soda crystals. Besides its domestic use it is largely employed in the manufacture of effervescing drinks and in medicine.

Soda, Caustic. (Fr. *Soude caustique*, Ger. *Ätznatron*, Sp. *Natron cáustico.*)

A white solid substance, whose chemical symbol is NaOH, largely used in the manufacture of soap, paper, glass, various fabrics, etc. It is much commonly prepared on a large scale by boiling lime and sodium carbonate together with water, and evaporating down to a clear solution, when a white fibrous mass remains.

Soda Crystals. (Fr. *Soude*, Ger. *Natron*, Sp. *Sosa.*)

This is the ordinary washing soda, the chemical symbol of which is $Na_2CO_3 10\ H_2O$. It is prepared by dissolving soda ash in water, boiling down the solution to a certain extent, and then allowing it to cool. The large white crystals deposited represent the substance. The crystals give off the greater portion of their water when exposed to the air.

Soda Water.

(See *Aerated Waters.*)

Sodium. (Fr. *Sodium*, Ger. *Natrium*, Sp. *Sodio.*)

The most widely distributed of the metals of the alkalies, occurring in many compounds, especially common salt, caustic soda, bicarbonate of soda, etc. These compounds are noticed under separate headings.

Sodium, Chloride of.

(See *Salt.*)

Sodium, Nitrate of.

(See *Saltpetre.*)

Sodium, Sulphate of.

(See *Glauber's Salt.*)

Solder. (Fr. *Soudure*, Ger. *Löthe*, Sp. *Soldadura.*)

A fusible alloy of lead and tin used for joining metals. The exact proportions in which these metals are combined vary according to the particular work for which the solder is required. The commonest of all, for plumbers' use, is composed of equal parts of tin and lead, with the addition of small quantities of borax, sal-ammoniac, choride of zinc, or resin. The solder used by silversmiths consists of a mixture of silver and copper, or silver and brass.

Sole. (Fr. *Sole*, Ger. *Sohle*, Sp. *Lenguado.*)

A genus of flat fish, very common round the shores of Great Britain, and very largely taken and sold in English markets. It is estimated that over 10,000 tons are sold annually in the London markets alone.

Soy. (Fr. *Soy*, *Soüi*, Ger. *Soya*, *Soje*, Sp. *Sargueta.*)

A sauce made in China and Japan from the seeds of the *Soja hispida*, a plant much cultivated in both these countries. The seeds resemble small kidney beans and are a very nutritive food. In preparing soy, which is a long operation, the seeds are softened by boiling with an equal quantity of ground wheat or barley, and adding a little salt. After being allowed to ferment, the mixture is strained and put away in pots. Soy is a common and much used condiment in the East. It is exported from China and Japan to England and the United States, and it enters into the composition of the majority of English sauces.

Spanish Fly.

(See *Cantharides.*)

Spelter.

(See *Zinc.*)

Speculum Metal. (Fr. *Métal de miroir*, Ger. *Spiegelmetall*, Sp. *Metal del espejo.*)

The hard alloy composed of copper and tin, two parts of the first being mixed with one part of the second. It is steel white in appearance and capable of taking a very high polish. For that reason it is used for the mirrors of reflecting telescopes.

Spence's Metal.

A greyish black substance, somewhat like cement, formed by melting together sulphide of iron and sulphur. It melts at a low temperature and is

used for making busts, medallions, etc., and also like lead for joining pipes. It was first made about twenty-five years ago.

Spermaceti. (Fr. *Spermaceti, Sperme, Blanc de baleine*, Ger. *Walnat, Spermacet*, Sp. *Espermaceti.*)

A white fatty substance prepared from the oil obtained from the head of the sperm whale. The oil requires repeated purification by washing and boiling with potash, and is afterwards prepared for use by draining and pressure. Commercial spermaceti is without either taste or odour. Sperm candles are made from a mixture of spermaceti and wax, the amount of the latter being about 3 per cent. of the whole. These candles give a brilliant and steady light, and are the standard for comparing the illuminating powers of artificial lights. Medicinally spermaceti is no longer used internally, but it is an ingredient of many kinds of ointments. The whole of this substance met with in commerce is obtained from the islands of the Pacific Ocean.

Spices. (Fr. *Epices*, Ger. *Gewürze*, Sp. *Especias.*)

Various aromatic condiments and substances used for flavouring. The principal of these are noticed under separate headings.

Spiegeleisen. (Fr., Ger., and Sp., *Spiegeleisén.*)

A variety of iron containing a large proportion of carbon and manganese. The name, which is the German for "mirror iron," is derived from the fact that upon fracture the plates shine like the glasses of a mirror. It is chiefly used in the manufacture of bessemer steel.

Spikenard. (Fr. *Nard indien*, Ger. *Narde*, Sp. *Nardo.*)

This perfume, also known as nard, is obtained from the root of the *Nardostachys Jatamansi*, a small plant which is found in the north of India. Its aromatic properties are more prized in the East than in Europe, though in Europe it is valuable for medicinal purposes, spikenard possessing strong stimulating properties.

Spinach. (Fr. *Épinard*, Ger. *Spinat*, Sp. *Espinaca.*)

The wholesome and well-known pot herb, the deep green leaves of the *Spinacia oleracea*, a plant cultivated in all parts of Europe. For culinary purposes it is served boiled and mashed, or as an ingredient in stews and soups. As in the case of many other pot herbs and vegetables there are many varieties of spinach grown.

Sponge. (Fr. *Eponge*, Ger. *Schwamm*, Sp. *Esponja.*)

The horny substance consisting of the skeletons of certain marine animals which are always found fixed to rocks. There are many varieties with particular names. The sponges of commerce are mostly obtained in the Mediterranean Sea and off the West Indies. The finest are found in the waters of Turkey, and there is a large export trade from Smyrna. The West Indian sponges are neither so soft nor so durable as those obtained from the Mediterranean. In addition to their domestic uses, sponges are of much value in surgery for removing blood and checking hæmorrage. They are also used as filters.

Sprats. (Fr. *Sprats*, Ger. *Sprotten*, Sp. *Meletas.*)

Well known small fishes of the herring genus. They are very abundant off the shores of Britain and the western coasts of Europe generally, especially in autumn and winter. Besides being used as a food they are in much request for the manufacture of anchovy paste, and the surplus stock form excellent manure.

Spruce. (Fr. *Sapin, Èpinette*, Ger. *Fichtensprossen*, Sp. *Pino.*)

A species of pine tree. The best known is found in Norway, and supplies white deal and the substance called Burgundy pitch. Its bark is used for tanning. The young shoots are boiled down in water, and after sugar or treacle has been added, the whole is allowed to ferment with yeast. In this way the beverage known as sprucè beer is produced. The liquor is variously flavoured. Black beer is another kind of spruce beer, made very extensively at Danzig.

Squills. (Fr. *Scilles*, Ger. *Meerzwiebeln*, Sp. *Escilas.*)

A genus of bulbous plants belonging to the order *lilaceae*, of which there are no less than seventy species. They are natives of southern Europe, but

are now widely spread over most parts of the old world. The variety used medicinally is the *scilla maritima* of Algeria. From the bulbs the drug of the chemist's shop is prepared. As a medicine this drug is valuable in cases of dropsy, and likewise as an expectorant and emetic.

Squirrel. (Fr. *Ecureuil*, Ger. *Eichhörnchen*, Sp. *Ardilla.*)

The skins of these little rodents are in much request for fur-linings. Large numbers of the skins are annually imported into this country from Russia and Siberia, those obtained from the latter country being esteemed the best.

Starch. (Fr. *Amidon*, Ger. *Stärkemehl*, Sp. *Almidon.*)

The substance occurring in grains in the cellular tissues of all plants, excepting certain kinds of sea-weed and lichens. It is a compound of carbon, hydrogen, and oxygen, its chemical symbol being $C_6 H_{10} O_5$ It appears in the form of solid granules possessing a distinct organized structure and varying in size with the nature of the plant from which it is derived. Starches are of two distinct kinds according as they are used for food or in the arts. The food starches comprise, among other things, arrowroot, sago, and tapioca. Starch for industrial purposes is chiefly obtained from potatoes, wheat, maize, and rice. The chief centre of manufacture in Great Britain is Paisley, where maize is used. At Norwich starch is made from rice, and at Belfast from wheat. The processes of manufacture differ according to the substances used. In addition to its use in laundry work starch is in great demand for making dextrin, for thickening and finishing calicoes, and for several processes of photography. When starch is ground and perfumed it forms violet powder.

Steatite. (Fr. *Stéatite*, Ger. *Speckstein*, Sp. *Galajia.*)

A hydrous silicate of magnesia, generally white or yellow in colour, occurring in many parts of the world and found in large quantities in Cornwall. It is soft to the touch and easily cut. Common steatite, or soapstone as it is generally called, is used for various purposes, especially polishing mirrors, fulling cloth, and diminishing friction in machinery. It is also used in the manufacture of porcelain, and is the basis of French chalk and rouge powder.

Steel. (Fr. *Acier*, Ger. *Stahl*, Sp. *Acero.*)

One of the three varieties of iron, the other two being wrought iron and cast iron. It is formed when bars of wrought iron are heated to redness for a certain time in contact with charcoal. The bar becomes fine-grained instead of fibrous, and the substance is more malleable and more easily fusible than the original bar-iron, and contains carbon to the extent of one or two per cent. When steel is quickly cooled it becomes very hard and brittle, and is especially adapted for making cutting tools. (See *Bessemer Steel.*)

Steel Pens. (Fr. *Plumes d'acier*, Ger. *Stahlfedern*, Sp. *Plumas de acero.*)

The common writing instrument manufactured entirely by machinery. The centre of the industry is England, and the principal place of production in the world is Birmingham.

Stilton. (Fr. *Fromage de Stilton*, Ger. *Stiltonkäse*, Sp. *Queso de Stilton.*)

The rich cheese, originally made at Stilton in Huntingdonshire, but now manufactured in several other parts of the country. It is the best of all English cheeses. It improves and ripens by being kept. It is very rarely put on the market until it is at least two years old.

Storax. (Fr. *Styrax*, Ger. *Storax*, Sp. *Estoraque.*)

A resin obtained by exudation from the stem of the *Styrax officinalis*, a shrub of Greece and Turkey. It was formerly much used in medicine and perfumery, but its place has been taken by liquid storax, a soft, viscid, dark brown resin obtained from the *Liquid ambar orientale*, a tall tree of Asia Minor. This substance is exported exclusively from Smyrna. Its medicinal value is confined to cases of chronic bronchitis.

Straw. (Fr. *Paille*, Ger. *Stroh*, Sp. *Paja.*)

The dried stalks or stems of various cereals. It is much used in agriculture as a bedding material and in the making of farmyard manure, and it is valuable for packing, thatching, making door mats, baskets, mattresses,

etc. It is likewise a paper-making material, the straw being reduced to a pulp and transformed into sheets when it is known as straw-board. Enormous quantities are employed in straw-plaiting, the straw obtained from wheat being the best. In England the centre of the trade is Luton. The finest plaits, however, are made in Tuscany. The common plaits are made in China, and the European market is flooded with the shipments from Canton. The Chinese competition has seriously injured the straw-plaiting industry of Luton and Bedofrd, but it has stimulated the straw hat and bonnet trade. Almost the whole of the straw plaits from China are shipped to England and afterwards re-exported to the continent. The chief external buyers of hats and bonnets are the Australian colonies.

Strawberries. (Fr. *Fraises*, Ger. *Erdbeeren*, Sp. *Fresas.*)

The sweet succulent fruit of various cultivated species of *Fragaria vesca*, widely distributed through the temperate regions of the globe. Forced strawberries are obtainable throughout the year, but the season for the natural grown fruit in England is from the beginning of June to the end of July. They are not only used for dessert, but in the manufacture of jams. For the latter purpose there are extensive imports, but the quality of the fruit is not nearly so good as that which is home grown.

Straw Hats. (See *Straw.*)

Straw Plaiting.

(See *Straw.*)

Strontium. (Fr. and Ger. *Strontium*, Sp. *Estroncio.*)

A metallic element resembling calcium and barium in its chemical properties. It occurs as a constituent in the minerals celestine and stronianite found in Scotland, especially in Argyleshire. It is a yellowish coloured substance and tarnishes rapidly on exposure to the atmosphere. Several of its compounds are valuable in chemistry, and nitrate of strontia is used in the manufacture of fireworks, particularly Bengal lights. It burns with a characteristic red flame.

Strophanthus Seeds. (Fr. *Semences de Strophanthus*, Ger. *Strophanthusnusse*, Sp. *Nuez de Strophanthus.*)

The seeds of the *Strophanthus hispidus*, a plant of which there are several species, found in the tropical regions of Asia and Afrirca. The seeds are rather over half an inch in length and one quarter of an inch broad. They are oval in shape and flattened at the sides. Their medicinal properties are the same as those of digitalis, but great care is required in the use of the drug derived from the seeds owing to its exceedingly poisonous nature. The imports are derived almost exclusively from West Africa.

Strychnine. (Fr. *Strychnine*, Ger. *Strychnin*, Sp. *Estricnina.*)

The powerful alkaloid poison obtained from the seeds of the *Strychnos nux vomica*, a shrub of the East Indies. Its chemical symbol is $C_{21}H_{22}N_2O_2$. Strychnine occurs in small colourless crystals, and is only slightly soluble in water. It is, however, easily dissolved in ether or chloroform. Its taste is intensely bitter and its properties extremely poisonous. Used in minute doses it is valuable medicinally in cases of nervous diseases.

Sturgeon. (Fr. *Esturgeon*, Ger. *Stör*, Sp. *Esturion.*)

A fish belonging to the Ganoid genus, of which there are about 25 different species. The common sturgeon is sometimes found in the rivers of Great Britain and is a royal perquisite. The sterlet is a small species of sturgeon, found principally in the Volga and the Danube. The products of the sturgeon, isinglass and caviare, form an important part of the commerce of Russia, especially at Astrakhan.

Suet. (Fr. *Graisse*, Ger. *Nierenfett*, Sp. *Sebo.*)

The pure solid fatty matter which occurs in masses about the intestines of several domestic animals, especially sheep and oxen. Beef suet is mainly used in cookery, while mutton suet is employed for medicinal purposes, particularly in the preparation of ointments and plasters. The suet is obtained from the internal fats by melting and straining. It is often used as a substitute for lard in preserving potted meats, fish, etc., from the action of the air. In addition to the large quantities of suet produced in Great Britain, vast imports are made into the country from South America.

Sugar. (Fr. *Sucre*, Ger. *Zucker*, Sp. *Azúcar.*)

The well known article of food which occurs in the juices of many plants, but which is prepared for commerce almost exclusively from the sugar cane and the beetroot. The sugar cane is a gigantic grass found in the tropical regions of both hemispheres. It has a cylindrical stem, the sap of which is rich in sugar in its ripe condition. After the stems have been cut they are passed between heavy rollers for the extraction of the juice, which is run into tanks and heated with lime. The substance is then allowed to stand for a time and is afterwards skimmed. The heating and skimming processes are repeated several times until the mixture is free from scum. A thick syrup remains and this is passed into shallow pans, in which, as it cools, sugar crystals are formed. The crystalline mass is the raw sugar, and the dark substance which drains off is molasses. Various modified mechanical contrivances are in use in different sugar producing countries. Beetroot sugar is prepared somewhat similarly from the beet. The root is crushed or sliced and the solution boiled down. The subsequent processes are the same for both cane and beet sugar. The manufacture of sugar from the beetroot has long been an important industry of France, Germany, Austria, and Russia. In order to prepare sugar for use and for commerce it is necessary to refine it. For this purpose the raw sugar is dissolved and filtered to remove impurities, and further treated with animal charcoal to remove the colouring matter. The pure colourless syrup is then run into vacuum pans, where it is evaporated until crystals are formed. This is the sugar of commerce, though further treatment is necessary to present it in the different forms under which it is sold.

During the last twenty years there have been very great fluctuations in the sugar trade. The beet sugar has competed keenly with the cane sugar, and the bounties granted by various foreign countries have inflicted great hardships upon the refining industry in Great Britain.

Suint. (Fr. *Gras de laine, Lanoline*, Ger. *Wollenfett, Lanolin*, Sp. *Lanoline.*)

The grease obtained from sheep's wool during the process of washing, sometimes known as wool fat, and also as lanoline. It has lately been used for soap making. This substance is obtained from the wool washing in this country and also from Australia.

Sulphonal. (Fr., Ger., and Sp., *Sulfonal.*)

An opiate of complex composition, the chemical symbol of which is $(CH_3)_2 C (SO_2C_2 H_5)_2$. It consists of white crystals. These are tasteless, and easily soluble in water. It has only recently become recognised in medicine.

Sulphur. (Fr. *Soufre*, Ger. *Schwefel*, Sp. *Azufre.*)

One of the most important of the non-metallic elements. It occurs free in certain volcanic districts, particularly in Sicily and Iceland, where it appears as yellow transparent crystals. In combination with many metals it forms sulphides, which constitute the ores from which the metals themselves are ordinarily obtained. The chief of these sulphides are galena and blende. The principal supplies of sulphur come from Sicily, where the element is found in beds of blue clay. In order to extract it the native substance is piled in a heap and loosely covered with earth. Heat is applied, a portion of the sulphur is ignited, and the remainder, being melted, trickles down to the bottom of the heap where it is collected. In this form it is exported, and when it arrives in this country it is subjected to distillation, the vapour being condensed in chambers. If the vapour is quickly cooled below its melting point it solidifies in the form of a fine crystalline powder known as flowers of sulphur. If then the flowers of sulphur are greatly heated the substance melts and may be cast into sticks. This is the brimstone or roll sulphur of commerce.

Sulphur is a yellow, brittle, solid substance, with very little taste or smell, insoluble in water, but soluble in bisulphide of carbon, oil of turpentine, benzol, and heated alcohol. At a temperature of 150° C. it melts and forms an amber-coloured thick fluid, darkening as the temperature rises until it becomes like thick treacle. It burns, when heated to 260° C., with

a pale blue flame, and emits a suffocating odour. At a temperature of 440° it boils and gives off red-coloured vapour.

In its various forms sulphur is used for a considerable number of purposes, chief among them being the manufacture of sulphuric acid, gunpowder, lucifer matches, vulcanite, and sulphurous acid.

Sulphuric Acid. (Fr. *Acide sulfurique*, Ger. *Schwefelsäure*, Sp. *Acido sulfúrico.*)

The most important acid known, as it is used not only in various arts and manufactures, but is the means by which numerous other acids are prepared. It is a brownish, heavy, oily liquid, the chemical symbol of which is H_2SO_4. Commercially it is generally known as oil of vitriol. It is manufactured to the extent of thousands of tons a week in south Lancashire alone. Immense quantities are consumed in the manufacture of soda and bleaching powder, in calico printing, and in dyeing. Dilute sulphuric acid, mixed with various compounds, is used medicinally as an astringent.

Sultanas. (Fr. *Sultanes*, Ger. *Sultansrosinen*, Sp. *Sultanes.*)

Small raisins imported from Turkey. They have neither pips nor stones. (See *Raisins.*)

Sumach. (Fr. *Sumac*, Ger. *Sumach*, Sp. *Zumaque.*)

The wood of the *rhus cotinus*, a tree of southern Europe, from which a valuable yellow dye is obtained. The bark is very rich in tannin, and is used extensively for the preparation of the finest kinds of leather. It is also used on occasions as a substitute for Peruvian bark. Practically the whole of the sumach of commerce is derived from Italy.

Sunflower. (Fr. *Hélianthe, Héliotrope*, Ger. *Sonnenblume*, Sp. *Eliotropio, Girasol.*)

A genus of coarse plants, of which the commonest example is the *helianthus annuus*. In Germany and Russia it is grown on a large scale for the sake of its seeds, which are variously used in commerce as a food for poultry, as a substitute for coffee, as a source of oil which is little inferior to olive oil, and as a substance for making oil cake. A good strong fibre is obtained from the stems of the plant and a strong, brilliant, yellow dye from the flowers. The various products of the sunflower are mainly exported by Russia.

Sunn Hemp.

Otherwise known as Indian hemp. It is the fibre obtained in southern Asia and tropical Australia from various species of *crotolaria*. The fibre, which is less soft than jute, is used for the manufacture of rope, twine, sack cloth, and other materials.

Tacamahac. (Fr. *Takamahac*, Ger. *Takamahat*, Sp. *Tacamahac.*)

Or Tacamahaca. The resinous exudation of various trees of tropical America, the principal being the *Icica tacamahaca* of Brazil. It has an exceedingly bitter taste, but a pleasing odour. It is often burned as incense in churches. It is used medicinally in the preparation of various ointments, especially for application in the case of indolent ulcers.

Talc. (Fr. *Talc*, Ger. *Talk*, Sp. *Talco.*)

A mineral composed almost entirely of silica and magnesia in the proportions of two to one. It varies considerably in colour from white to green. It has a pearly lustre and is unctuous to the touch. It occurs in combination with other rocks in Scotland, the Pyrenees, the Tyrol, and the United States. Talc is used for various purposes, among which may be mentioned the manufacture of porcelain clay, fulling, and the making of crucibles and crayons.

Tallow. (Fr. *Suif*, Ger. *Talg*, Sp. *Sebo.*)

The harder and less fusible varieties of the fat of animals, especially that of oxen and sheep. It is composed of stearine, palmitin, and olein in varying quantities. It is prepared by melting the fat of animals at the lowest possible temperature, allowing the liquid to stand, and drawing off the clear fat. Tallow is mainly used for the manufacture of candles and soap. A species of tallow, harder than animal tallow, is obtained from the tallow tree, a native of Japan and China, and now largely cultivated in the southern parts of the United States. This is also used for the manufacture of candles

which are used in Chinese temples. The seeds of the tree produce an oil, and the leaves are used in dyeing black.

Tamarind. (Fr. *Tamarin*, Ger. *Tamarinde*, Sp. *Tamarindo.*)

The fruit of the leguminous *Tamarindus indica*, a lofty tree grown in the tropical parts of Asia, Africa, and America. The seeds of the tree are contained in a pod, those of the East being larger than those of the West. The fruit is preserved in syrup and is exported, mainly from the West Indies, for medicinal purposes. The wood of the tamarind tree is useful for building and cabinet making, the bark is employed as a tonic and astringent, and the leaves yield a yellow dye-stuff.

Tampico Fibre. (Fr. *Fibre de Tampico*, Ger. *Tampicofaser*, Sp. *Fibra de Tampico.*)

The fibre obtained from the leaves of the *Yucca baccata*, a Mexican plant, and shipped chiefly from Tampico, on the Gulf of Mexico. It is manufactured into cordage, rugs, and various fabrics.

Tanning Substances.

The principal of these are noticed under separate headings. (See *Leather.*)

Tapioca. (Fr. *Tapioca*, Ger. *Marksago*, Sp. *Tapioca.*)

The granulated starch of a species of *manibot*, extensively cultivated in South America, and also in the East Indies. The starch is obtained from the root of the plant, and carefully roasted on hot plates, great care being taken not to overheat it. In its commercial form it appears as small lumps, crisp, transparent, and very irregular in shape. The varieties known are fine flake, medium pearl, and seed pearl. Tapioca is highly nutritious and forms an excellent food for infants and invalids. The chief exports are from Brazil and Singapore.

Tar. (Fr. *Goudron*, Ger. *Theer*, Sp. *Brea.*)

The dark, semi-solid substance, of disagreeable smell, obtained as a product of the destructive distillation of various organic substances. The tars of commerce are derived from the distillation of coal and wood. Coal tar is a highly complex mixture of a large number of substances, the principal of which are the hydrocarbons. Its value as a commercial article has been much increased in recent times by the fact that it is the source of a large number of the aniline colours. By distillation coal tar is separated into gases, ammoniacal liquor, light oil, dead oil, and pitch. Wood tar is largely obtained in connection with the preparation of wood charcoal by the combustion of fine trees. Tar has valuable antiseptic properties, and is used as a coating for preserving iron and timber, for tarring cordage, and for various medicinal purposes.

Tartar, Cream of. (Fr. *Crême de tartre*, Ger. *Weinsteinrahm, Kaliumbitartrat*, Sp. *Cremor de tártaro.*)

Also known as bitartrate of potash, having as its chemical symbol $KHC_4H_4O_6$. It is obtained by purifying crude argol. It is sometimes used as a baking powder, and medicinally it acts as a mild aperient.

Tartaric Acid. (Fr. *Acide tartarique*, Ger. *Weinsteinsäure*, Sp. *Acide tartarico.*)

An important organic acid, occurring free or in combination with bases in the fruits and juices of many plants, especially the grape. Its chemical symbol is $C_2H_3(OH)_2(COOH_2)$. It is prepared from argol, an impure bitartrate of potash, which is deposited in wine vats during fermentation, by treatment with chalk and sulphuric acid. Tartaric acid, which dissolves easily in water and has a sour taste, appears in the form of white transparent crystals. It is much used in calico printing, and in the manufacture of effervescing drinks.

Tea. (Fr. *Thé*, Ger. *Thee*, Sp. *Té.*)

The dried leaves of a species of plants included in the genus *thea*. Although there are several species, the tea of commerce is derived from the *Thea Chinensis* of China, and the *Thea Assamica* of India. Until the middle of the nineteenth century almost the whole of the tea which entered into commerce was obtained from China, but since that time the cultivation of the tea plant has been increasing in India and Ceylon, and now nearly one half of the supplies of the world are derived from the Indian Empire. The tea plant is an evergreen shrub

with thick leaves and white flowers. The leaves are picked by hand and subjected to various processes, drying by exposure to air, roasting, rolling by hand, and again roasting over charcoal fires. The best tea is obtained from the young leaves of the plant. The different kinds of tea depend upon the varieties and qualities of the plant, the soil, the climate, and the method of treatment. Green tea is obtained in the same manner as black tea, but in the case of the former the leaves of the plant are exposed to the air for a shorter time than when the latter is produced. Of black teas the best known as Congou, Pekoe, Souchong, and Bohea, while Hysons and Gunpowder are the principal green varieties. In central Asia and Tibet tea, pressed into the shape of bricks, and hence called brick tea, is most commonly used. It is prepared with a slight admixture of butter and salt. Tea forms one of the commonest articles of consumption and its stimulating action is the result of the presence of the alkaloid theine or coffeine.

Teak. (Fr. *Teck, Tek*, Ger. *Thekabaum*, Sp. *Tek, Madera indica.*)

The hard and durable timber of the *Tectona grandis*, a gigantic tree of India and the East Indies. It is particularly prized for shipbuilding and the construction of bridges. It is also used for the making of railway carriages, furniture, bridges, etc. The leaves of the tree yield a red dye. Teak is mainly exported from Burmah.

Teasel. (Fr. *Cardère*, Ger. *Kardéndistel*, Sp. *Capota.*)

A species of herb of which the best known is the *Dipsacus fullonum*, found to a certain extent in England, and very common in southern Europe and northern Africa. The flower heads are used by cloth manufacturers for passing over the surface of cloth and raising the nap. There are enormous imports of these flower heads into England from France and Austria.

Terra-cotta. (Fr. *Terre cuite*, Ger. *gebrannte Erde*, Sp. *Tierra quemada.*)

A kind of pottery or earthenware. the name signifying baked clay. It is simply a superior variety of brickwork and is largely used for decorative purposes, statuary. etc. It is composed of a mixture of potter's clay and fine colourless sand made into a paste and moulded into the required shape, dried in the air, and fired at a high temperature. Terra-cotta, when well made, is close and smooth in texture and retains its bright colour when exposed to smoke or acid laden air. This substance has recently come into great favour, and is now largely manufactured in south London.

Thread. (Fr. *Fil*, Ger. *Faden, Zwirn*, Sp. *Hilo.*)

The fine cord or filament of cotton. flax, or silk, used for sewing, Any fibrous substance which is woven is first spun into yarn and called thread, but sewing thread consists of two or more yarns twisted together. Cotton thread is made at Manchester and Glasgow, but the chief centre of the manufacture is Paisley, which turns out about one half of the thread required by the whole world. Silk thread is often known by the name of twist.

Thyme. (Fr. *Thym*, Ger. *Thymian*, Sp. *Tomillo.*)

A species of shrub grown in various parts of Europe, and used for culinary purposes. From the lemon thyme an oil of thyme is obtained by distillation, and this is used for the preparation of thymol, a useful antiseptic much valued in hospitals to counteract the bad smells arising from decomposing animal matter.

Timber. (Fr. *Bois de charpente*, Ger. *Bauholz*, Sp. *Maderage.*)

The principal kinds of timber are noticed under separate headings.

Tin. (Fr. *Étain*, Ger. *Zinn*, Sp. *Estaño.*)

The well-known beautiful and lustrous white metal. It is extremely malleable, and can be rolled out into very thin plates, called tin foil. Tin undergoes little change when exposed to the air unless it is heated, when a film of oxide forms on its surface. Its specific gravity is 7·3. Tin is rarely found native, but occurs chiefly in the form of tinstone or cassiterite, an ore which is abundant in Cornwall and Devonshire, the Malay Peninsula, and Australia. The ore is broken into small pieces and finely pounded in a stamping machine, after which it is roasted in a reverberatory

furnace and gradually purified. It is as a component of various alloys that tin is especially valuable. The most important of these are gun-metal, bell-metal, speculum metal, solder, pewter, Britannia metal, and bronze. Mirrors are silvered by an amalgam of tin and mercury. Each of these substances is noticed under separate headings. The supplies of Great Britain are largely supplemented by imports derived from Australia, especially New South Wales.

Tin plate is composed of thin sheet iron covered with a thin coating of metallic tin to preserve the iron from oxidation by exposure to the atmosphere.

Tincal. (Fr. *Tincal, Biborate de soude*, Ger. *Tinkal*, Sp. *Atincar.*)

The name for crude borax which is imported from India in its impure condition.

Tobacco. (Fr. *Tabac*, Ger. *Tabak*, Sp. *Tabaco.*)

The dried leaves of several species of *nicotiana*, the principal being the *nicotiana Persica*, the source of the highly prized Persian tobacco, the *nicotiana rustica*, from which the tobacco of Latakia, Turkey, and Manilla are derived, and the *nicotiana repanda*, the American variety of the plant. The tobacco plant is remarkable for its straight stems and long broad leaves. It is grown on both sides of the equator, as far as the 50th parallel of latitude, but its properties, especially those of the volatile oil and alkaloid nicotine it contains, vary according to the climate, the soil, and the conditions of cultivation. To prepare it for the market the leaves of the tobacco plant are cut, dried, and stripped. The process of drying varies in different parts of the world; sometimes it is done naturally by the sun, while at other times artificial means are used. The leaves are generally allowed to lie in heaps for a week or two and covered over, during which period a slight fermentation takes place. After being sorted the leaves are pressed and packed in barrels for exportation. The subsequent treatment and manufacture give rise to the various commercial varieties which are well known in the market. Shag is the moistened and compressed leaves which are afterwards cut into fine shreds. Cavendish is the name given to tobacco leaves which are moistened with syrup and pressed into cakes. For the manufacture of twist tobacco the fermented leaves are twisted either by hand or machinery into the form of rope—the thin rope being called pigtail, and the thicker rope bogie.

For the manufacture of cigars the midribs of the dried leaves are first removed. The leaves are then moistened with water or a solution of nitre and rolled round smaller fragments into cylindrical form. For good cigars the leaves should be uniform throughout, but owing to various causes common leaves are very frequently used for the interior. The best Havana cigars are all derived from Cuba, but Havana boxes are frequently filled with cigars of inferior brands. Cheroots come from the Philippine Islands. Mexican and Brazilian cigars have recently come into favour, as well as a cheaper kind manufactured in India.

Cigarettes were at one time made almost exclusively from tobacco grown in Syria. They are now manufactured from many different kinds, the tobacco being frequently scented or adulterated with opium.

Snuff is made from moistened tobacco which, after fermentation, has been dried, powdered, and scented.

The supplies of tobacco for Great Britain are chiefly derived from different parts of America, the Levant India, Sumatra, and the Philippine Islands. Except under very limited conditions, the cultivation of the tobacco plant in Great Britain is forbidden under heavy penalties.

Tokay. (Fr., Ger., and Sp., *Tokay.*)

A renowned brownish-yellow wine of Hungary, made from the grapes of the vines which grow on the slopes of the Hegyalja Mountains. There are several varieties of this wine on the market, the principal being the Essence, regarded by some judges as the best of all wines, and the Ansbruch. Owing to its great reputation and its limited supply Tokay wine is difficult to obtain in a pure condition. It is very frequently largely adulterated with inferior wines, and French and

German imitations are found in all the markets of Europe.

Tolu. (See *Balsam.*)

Tomato. (Fr. *Tomate*, Ger. *Liebesapfel*, Sp. *Tomate.*)

The well-known culinary vegetable, the fruit of the *Lycopersicum esculentum.* It is often known as the love apple. A native of South America, it was introduced into Europe nearly four centuries ago and thrives in most countries, but especially in Italy. The demand in Great Britain is so great that the native supplies are altogether inadequate. The fruit, when imported, comes in an unripe condition. It is then best fitted for pickling and for making into sauces, etc. When ripe the tomato is eaten either raw or cooked.

Tonca Bean. (Fr. *Fv e de Tonca*, Ger. *Tonkabohne*, Sp. *Haba de Tonca.*)

The seed of the *Dipterix odorata*, a tall tree which grows in the northern part of South America, especially Guiana. It has the pleasant odour of freshly mown hay, and is much used by perfumers for scenting purposes, and is often carried in snuff boxes to give a pleasing smell to the snuff.

Tongues. (Fr. *Langues*, Ger. *Zungen*, Sp. *Lénguas.*)

The tongues of certain animals are highly esteemed as food and enter largely into commerce, especially when tinned. The chief of these are ox tongues, which are exported in enormous numbers from Uruguay, and reindeer tongues which come from Russia. Sheeps' tongues, fresh and frozen, are obtained from Australia.

Topaz. (Fr. *Topaze*, Ger. *Topas*, Sp. *Topacio.*)

A mineral generally included among gems. It is largely composed of silica, alumina, and a small quantity of oxide of iron. It is extremely hard. Its colour is generally of a yellowish hue, but pink and blue varieties are sometimes found. It occurs in many parts of the world, but the topazes most prized by jewellers come from Brazil. The oriental topaz is a yellow variety of corundum, scarcely differing, except in colour, from the emerald, the sapphire, and the ruby. The false topaz is merely a yellow variety of quartz found in great abundance in the Grampians.

Tortoise-shell. (Fr. *Ecaille de tortue*, Ger. *Schildkrotenschale*, Sp. *Concha de tortuga.*)

The epidermal horny plates which cover the back of the hawksbill turtle, the carnivorous reptile found along the coasts of the United States. The plates are peculiar in that they do not join but overlap each other like the tiles of a roof. In thickness they seldom exceed one-eighth of an inch. Their beautiful mottled colour and semi-transparent character are well known. In Great Britain the chief uses of tortoise-shell are in the manufacture of combs and other fancy objects, and in inlaying ornamental furniture. The plates can be removed from the back of the turtle without injuring it, but the quality of the plates of the second growth is not so good as that of the first.

Tow. (Fr. *Étoupe*, Ger. *Werg*, Sp. *Estopa.*)

The waste fibre or refuse which remains in carding flax and hemp. In addition to the tow obtained in Great Britain large quantities are imported from various foreign countries. Tow is largely employed in the manufacture of bags, sheetings, and yarn. It is also used in the manufacture of paper.

Toys. (Fr. *Jouets*, Ger. *Spielzeug*, Sp. *Trebejos.*)

In addition to those made in Great Britain, principally in London and Birmingham, there are large imports of toys from Germany, France, and Switzerland. The centre of the manufacture on the continent is Nuremburg. Many of the toys imported into England are re-exported to the colonies and to the United States.

Treacle. (Fr. *Thériaque*, Ger. *Theriak*, Sp. *Teriaca.*)

The dark, viscous, uncrystallizable juice of the sugar cane obtained in the manufacture of sugar. It is that syrup which remains when the crystallized sugar has been separated. It has remarkable sweetening properties. (See *Sugar.*)

Truffles. (Fr. *Truffles*, Ger. *Trüffeln*, Sp. *Criadillas.*)

A genus of fungi which grow underground, chiefly used as a flavouring agent for culinary purposes. They are generally found in light chalk soils and in woods where beech, oak, birch, and

chestnut trees grow. They are not common in England, but the crop in France is said to be of the annual value of one million sterling. Truffles are usually black, or pinky white. In order to obtain them a particular breed of dog is employed, the discovery being made by means of the smell. In some parts pigs are trained for the same purpose. The fungus is sometimes as large as a cocoa-nut. France is the chief exporting country, and they are sent out packed in bottles.

Tulips. (Fr. *Tulipes*, Ger. *Tulpen*, Sp. *Tulipan.*)

The well known flowers which have been, and are still, extensively cultivated in Holland. Hundreds of acres are under cultivation in the Netherlands, principally in the neighbourhood of Haarlem, and bulbs are exported to the annual value of more than £100,000. There are hundreds of varieties of tulips, but all are arranged under the four groups of bizarres, byblæmens, roses, and selfs.

Tulip Tree. (Fr. *Tulipier*, Ger. *Tulpenbaum*, Sp. *Tulipero.*)

A magnificent tree of the temperate parts of North America. Its pale yellow timber is valued by coach builders and cabinet makers on account of its lightness, strength, and durability. The bark is used medicinally for its bitter tonic properties.

Tulle. (Fr. *Tulle*, Ger. *Tüll*, Sp. *Tul.*)

The thin silk lace fabric of very open structure, used for trimmings, caps, veils, etc. An imitation tulle is made of cotton. The manufacture is fairly distributed, though it was originally confined to the town of Tulle, in the department of Corrèze, France.

Tungsten. (Fr. *Tungstène*, Ger. *Wolfram*, Sp. *Tungstena.*)

A white, hard, brittle, heavy metal found in Cornwall, generally in combination with tinstone. It is sometimes used in small quantities to give additional hardness to steel. One of its compounds, tungstate of soda, is soluble in water, and when added to the starch employed for stiffening light fabrics, such as muslin, the tungstate renders the fabrics uninflammable.

Tunny. (Fr. *Thon*, Ger. *Thunfisch*, Sp. *Atun.*)

A fish of the mackerel order, found abundantly in the Mediterranean. In addition to its use as a food, an oil is obtained from it, which, like several other fish oils, is used for dressing leather.

Turbot. (Fr. *Turbot*, Ger. *Steinbütt*, Sp. *Rombo.*)

The well known flat fish, which is highly prized as a food and which is inferior in value to the sole alone. It is very plentiful off the coasts of Great Britain and France, and the demand for it is very great in both countries. Like the sole the turbot is entirely absent from the coasts of America.

Turmeric. (Fr. *Curcuma*, Ger. *Gelbwurz*, Sp. *Cúrcuma.*)

The yellow dye obtained from the roots of the *curcuma longa*, a plant which was originally cultivated in India and other parts of Asia, but now widely distributed throughout the tropical regions of the globe. The best turmeric is still obtained from India. Besides being used as a dye it is an important ingredient of various condiments, especially curry powder, and it is also used to adulterate mustard.

Turnip. (Fr. *Navet*, *Rave*, Ger. *Rübe*, Sp. *Naba.*)

The hardy biennial plant, the roots of which are valuable as a cattle food as well as a flavouring agent for soups, stews, etc. There are two principal varieties, the ordinary white turnip and the yellow swede. It does not form a very nourishing article of diet as it contains no starch, and more than 90 per cent. of it consists of water. It is estimated that the total crop of the United Kingdom is not less than twenty-five million tons per annum.

Turpentine. (Fr. *Térébenthine*, Ger. *Terpentin*, Sp. *Trementina.*)

The oily, semi-solid, resinous substance which exudes from various species of pine trees, though Venice turpentine is obtained from the larch. The chief seat of the turpentine industry is North Carolina, from which state Great Britain imports over twenty thousand tons per annum in barrels. By distillation oil of turpentine is obtained and resin is left behind. This oil of turpentine is the ordinary turpentine of commerce and has the chemical symbol C_{10} H_{16}. It is

extensively used in the preparation of oils, paints, and varnishes. Medicinally it is valuable as a local irritant to be applied in cases of rheumatism, and as an antiseptic.

Turquoise. (Fr. *Turquoise*, Ger. *Türkiss*, Sp. *Turquesa.*)

A mineral occurring in differently shaped masses, of a blue or bluish green colour, much used in jewellery. It is a phosphate of alumina containing small quantities of the oxides of iron and copper. The best specimens are found in Persia.

Turtle. (Fr. *Tortue*, Ger. *Schildkröte*, Sp. *Tortuga.*)

Marine reptiles, one of the most valuable species being the green turtle annually imported in large numbers from Ascension for the manufacture of turtle soup. The hanksbill turtle of America is the source of tortoise shell.

Tusseh. (Fr., Ger., and Sp., *Tusseh.*)

A peculiar coarse silk obtained from several large moths of India, especially the *Antheraea mylitta.* During recent years this silk has been increasingly in demand and large imports are made annually by Lyons.

Tweeds (Fr. *Étoffes ecossaises*, Ger. *Schottländichestoffe*, Sp. *Materias de Escosia.*)

A special class of Scotch woollen fabrics of a stout, close woven texture, used for male clothing and sometimes for ladies' mantles.

Twills. (Fr. *Étoffes plissées*, Ger. *Geköpertes, Zeng*, Sp. *Telas de lana.*)

Woven ribbed cloths in which the warp is raised one thread and then depressed two or more threads for the passage of the weft. Owing to this mode of manufacture twilled fabrics have always the appearance of diagonal lines.

Ultramarine. (Fr. *Outremer, Bleu d'outremer*, Ger. *Ultramarin*, Sp. *Ultramar.*)

A beautiful blue pigment used by painters, paper-stainers, calico printers, and others. It was formerly obtained from lazulite, but is now artificially compounded by mixing china clay, charcoal, and sulphate of sodium, and roasting the whole with sulphur. Ultramarine is manufactured extensively in Germany, France, and Belgium, but the imports of this substance by Great Britain are almost entirely from the first-named country.

Umber. (Fr. *Terre d'ombre, Ombre*, Ger. *Ambra*, Sp. *Sombra.*)

A pigment of various shades of brown, a brown earthy mineral obtained chiefly in Italy and Cyprus, though sometimes found in England and Wales. The mineral is ground to powder, and is valuable in the preparation of oil and water colours. It is also used as an ingredient of house painter's colours.

Valencias. (Fr., Ger., and Sp., *Valencias.*)

A variety of raisins made from grapes grown in Turkey. The bunches of grapes are dipped into a hot alkaline solution before being dried in the sun.

Valerian. (Fr. *Valeriane*, Ger. *Baldrion*, Sp. *Valeriana.*)

A well-known shrub of which there are many different species, that of Britain being the *Valeriana officinalis*, or common valerian. The root is valuable in medicine on account of its stimulating properties, and it is prescribed in cases of hysteria.

Valonia. (Fr. *Velanide*, Ger. *Knoppern*, Sp. *Agalla.*)

The commercial name of the acorn cup of a species of oak, *quercus aegilops*, which flourishes in southern Europe, Asia Minor, and Syria. It is very rich in tannic acid, and is consequently in great demand by tanners. After oak bark it is the most important of all the substances used in the manufacture of leather. Very large shipments are made every year from Smyrna, and a small quantity is also exported from Greece.

Vanadium. (Fr., Ger. and Sp., *Vanadium.*)

A very rare metal, generally found in certain iron ores and clays. It enters but little into commerce, though some of its salts are used for making aniline black, and for colouring porcelain.

Vanilla. (Fr. and Ger. *Vanille*, Sp. *Vainilla.*)

A species of orchid, and the only variety which has any economical value. The most esteemed fruit is a native of the West Indies, but it is now extensively cultivated in most tropical countries. The fruit is a kind of cylindrical food from seven to ten inches in length. It is gathered before

it is ripe, and generally steeped in the oil of the cachu nut. Vanilla has a strong and agreeable smell and a sweet taste. It is much used by perfumers, and it is also employed for flavouring chocolates, sweetmeats, ices, and liqueurs. The chief imports are from Mexico, Brazil, and Mauritius.

Varnishes. (Fr. *Vernis*, Ger. *Firnisse*, Sp. *Barniz.*)

Solutions of gum resins in various volatile liquids and fixed oils, used for coating wood and metal work to protect it from exposure to air and moisture. The principal resinous substances employed in the manufacture of varnishes are separately noticed.

Vaseline. (Fr. *Vaseline*, Ger. *Vaselin*, Sp. *Vaseline.*)

A pale yellow semi-solid substance obtained from petroleum or paraffin. It possesses neither taste nor smell. Vaseline has the advantage over animal fats of never becoming rancid. It is largely used in the making of ointments and salves, is an excellent lubricant, and is valuable as a coating for fine steel instruments to preserve them from rust.

Vegetable Ivory.

(See *Ivory.*)

Vegetable Marrow. (See *Gourd.*)

Vellum.

(See *Parchment.*)

Velvet. (Fr. *Velours*, Ger. *Sammet*, Sp. *Terciopelo.*)

A dress fabric made of silk, and woven with a looped surface. This surface is cut, and a thick, fine, close-set pile is the result. A mixture of cotton and silk stuffs manufactured in the same way as velvet is known as velveteen. The great centres of the velvet trade are Lyons and Crefeld.

Verdigris. (Fr. *Vert de gris*, Ger. *Grünspan*, Sp. *Verdete.*)

A green or blue pigment used by painters and dyers, and also employed in the manufacture of other green colours. It is a powdered acetate of copper and is largely made in France by exposing thin sheets of copper to the vapour of acetic acid arising from the marc or pressed skins of grapes by fermentation.

Verditer. (Fr. *Verditer*, Ger. *Bremerblan*, *Bremergrün* Sp. *Verdor.*)

A blue or green pigment, the hydrated oxide of copper, the colour varying according to the completeness of the oxidation. It is mainly used for paper staining. The varieties of verditer are often known as Bremen blue and Bremen green.

Vermicelli. (Fr. *Vermicele*, Ger. *Fadennudeln*, Sp. *Fidéos.*)

The finer form of macaroni, made entirely in Italy.

Vermilion. (Fr. *Vermillon*, Ger. *Zinnober*, Sp. *Cinabrio.*)

The red sulphide of mercury, also called cinnabar, obtained by grinding the native cinnabar. It is, however, generally made artificially by heating a mixture of mercury and sulphur, six parts of the former to one of the latter, in a revolving vessel until the combination is complete, and afterwards grinding the whole. Vermilion is used in painting and for colouring sealing wax. In addition to the production in Great Britain for home use, supplies are obtained from Germany and France.

Vermouth. (Fr. *Vermout*, Ger. *Wermuth*, Sp. *Ajenjo.*)

A bitter white wine flavoured with wormwood, gentian, and other herbs. It is manufactured in France and Italy, and in the latter country it is much used as a cordial and appetiser especially when diluted. The small English imports are obtained from Geneva and Marseilles.

Vetiver. (Fr., Ger., and Sp., *Vetiver.*)

The fragrant fibrous root of a grass called cuscus, found in swamps in India. In the East the roots are used for weaving into baskets, fans, screens, and covers. In Europe vetiver is valuable for an oil extracted from it, which is used in perfumery. It is also employed for driving away moths from clothing.

Vevey. (Fr. *Cigares de Vevey*, Ger. *Vevey-cigarren*, Sp. *Cigarros de Vevey.*)

The name of a peculiar kind of cigars which are manufactured and exported from Vevey, a Swiss town situated on the northern shores of the Lake of Geneva.

Vinegar. (Fr. *Vinaigre*, Ger. *Essig*, Sp. *Vinagre.*)

A form of acetic acid largely used for culinary purposes. It is a product of the fermentation of various vegetable substances. In Great Britain, vinegar is generally made from malt, while on the continent of Europe it is chiefly

made from cheap sour wines. Wood vinegar, obtained in the destructive distillation of wood, is mainly used in chemical operations, but it is very frequently employed by pickle manufacturers. Aromatic vinegar, used medicinally for filling smelling bottles, is a mixture of acetic acid, camphor, oil of cloves, lavender, and other perfumes. Wine vinegar is imported into Great Britain almost exclusively from Bordeaux.

Vitriol, Oil of. (Fr. *Acide sulfurique*, Ger. *Schwefdsäure*, Sp. *Acido sulfurico.*)

The commercial name for sulphuric acid.

Vulcanite.

(See *Ebonite.*)

Walnut. (Fr. *Noix, Noyer*, Ger. *Walnuss*, Sp. *Nuez.*)

The popular name of the fruit of the *Juglans regia* as well as of the tree itself. The timber is extremely hard and durable, and does not split. It takes a fine polish, and is used for making furniture and gun stocks. The bark is useful for tanning purposes. The fruit is a hard green shell containing the well-known nut, which not only serves as a dessert nut, but is frequently pickled. Walnut oil is expressed from the kernel, and the oil is employed by painters. The cake which remains over forms a good feeding stuff for cattle. The walnut tree is grown in England, but the demand both for timber and nuts has to be made up by importation, especially from France and Belgium.

Walrus. (Fr. *Morse, Cheval marin*, Ger. *Wallross*, Sp. *Caballo marino.*)

A marine mammal of the northern arctic regions, sometimes known as the morse. It is commercially valuable for the oil obtained from its blubber, and for the ivory obtained from its tusks, which is whiter and harder than elephant ivory. This ivory is used for the manufacture of trinkets, buttons, paper knives, etc. The hide of the walrus is sometimes made into leather.

Watches. (Fr. *Montres*, Ger. *Uhren*, Sp. *Keloj.*).

The watch making industry has been revolutionized within late years through foreign enterprise and competition. The best watches are still made in London, but the introduction of machinery in the United States has enabled watches and clocks to be produced at an extremely low price. Switzerland, France, and Germany also export large numbers of watches to all parts of the world.

Water Melon.

(See *Melon.*)

Wax.

(See *Beeswax, Candleberry, Japan Wax.*)

Whalebone. (Fr. *Baleine, Barbe de baleine*, Ger. *Fisch-bein*, Sp. *Ballena.*)

The long thin plates which are developed in the roof of the mouth of certain species of whale. They are not bone at all, but rather a kind of hair. Whalebone is strong, flexible, compact, and light, and is used for a large number of purposes, but especially for the manufacture of strong brushes.

Wheat. (Fr. *Blé*, Ger. *Weizen*, Sp. *Trigo.*)

One of the most important of the food grains of commerce, the product of the *Triticum vulgare.* It is more grown in the temperate parts of the world than any other grain, and it is the staple food of the more highly civilized races. The various kinds of wheat differ somewhat in their composition, but English wheat is made up as follows:—Water, 14·5; albumoids, chiefly fibrin, 11; starch, 69; fat, 1·2; cellulose and lignose, 2·6; mineral matter or ash, 1·7. It is a valuable flesh-forming and nutritive substance, and is a particularly cheap article of food. The chief supplies, to make up the deficiencies of Great Britain, are drawn from the United States, Russia, Roumania, and India. The crushed grain of wheat is flour, the cuticle of the grain separated from the flour being bran. The stalk of the plant when dried is straw, and contains a considerable amount of silica.

Whisky. (Fr., Ger., and Sp., *Whisky.*)

The well-known spirit distilled from malt or a mixture of malted and raw grain. It is also largely made from potatoes and other starch yielding materials. Pure malt whisky is made almost exclusively in Scotland. In Ireland only one-third of the materials used is malt, the rest being barley,

oats, and maize. In England much of the whisky is made from a root prepared from various cereals with malt and sugar. In all cases the method of manufacture consists of two processes—fermentation and distillation. When first made whisky is a colourless liquid, and its various shades are obtained by storage in sherry or other wine casks, or by the addition of some colouring matter. Proof spirit consists of equal parts of alcohol and water, while that sold by the retail dealers is generally from 10 to 20 per cent. under proof.

White Lead. (Fr. *Blanc de plomb, Céruse*, Ger. *Bleiweiss*, Sp. *Albayalde.*)

A pigment much used by painters, made by the decomposition of lead with various acids, especially dilute nitric acid. When dry it is in the form of cakes, in which form it appears in the market.

Wincey.

A textile fabric of mixed character, consisting of a cotton warp and worsted weft. The fabric is either plain or twilled. The manufacture is mainly carried on at Perth and Aberdeen, and the article is chiefly used for making gowns.

Wine. (Fr. *Vin*, Ger. *Wein*, Sp. *Vino.*)

The alcoholic liquid obtained from the juice of the grape, after it has been expressed, by fermentation. The juice, technically called must, is a thick fluid and consists of a most complex mixture of different substances. Great care is required when the fermentation commences, and it is upon this part of the process of wine making that the success or failure of the whole depends. If the fermentation is stopped before the whole of the sugar is converted into alcohol, a fruity wine is produced, while a dry wine is the result of complete conversion. Sparkling wines are the result of bottling while fermentation is still going on. The colour of wines depends partly upon the colouring matter in the skins of the grapes and partly upon the substances added. The principal kinds of wine are noticed under separate headings.

Wire. (Fr. *Fil de metal*, Ger. *Metalldraht*, Sp. *Hilo.*)

The thin threads or ribbons of different metals, especially copper, brass, steel, and iron. The manner in which wire can be drawn depends upon the property of ductility possessed by the metal. Gold is the most ductile of all and lead the least. Wire is most extensively used in telegraphy and for the manufacture of wire-ropes and wire netting. Wire ropes have practically taken the place of cables and chains for all kinds of heavy work.

Woad. (Fr. *Pastel, Guède*, Ger. *Waid*, Sp. *Pastel, Glasto.*)

A plant which was formerly much cultivated in Great Britain for the sake of the blue dye obtained from it. The commonest species is the *Isotis tinctoria*, found in Lincolnshire. Before indigo was introduced into England the woad dye was employed for dyeing woollens. At the present time it is used by dyers for mixing with indigo to facilitate fermentation.

Wolfram. (See *Tungsten.*)

Wood. (Fr. *Bois*, Ger. *Holz*, Sp. *Madera.*)

The principal trees which are cultivated for the supply of timber are noticed under separate headings.

Wood Pulp. (Fr. *Pâte de bois*, Ger. *Holzmass*, Sp. *Medida de leña.*)

A valuable commercial article used for paper-making. The pulp is obtained from the pine tree, and the main export trade is done by Norway and Sweden. It is sent out loose in boxes or pressed into sheets and packed in bales.

Wool. (Fr. *Laine, Poil*, Ger. *Wolle*, Sp. *Lana.*)

The hairy covering of certain animals, used for the manufacture of various fabrics. Next to cotton it is the most important of all fibres. The wool of the alpaca, the Angora goat, the camel, and the mohair goat are largely used for the production of woollen goods, but the chief supplies of the substance are derived from the sheep. Particular kinds of wool are imported from various European countries and India, but the greater portion of sheep's wool comes from Australia and South Africa. London is the greatest wool market of the world and a very large proportion of the wool imported is re-exported. Wool is classified in several ways, but there is one distinction invariably established between

long and short, the former being used for the manufacture of worsteds and the latter for woollen cloths. After the fleeces are shorn from the sheep they are scoured and dried. The dried wool is then oiled. If it is long it is combed, and if short carded. The various processes to which it is afterwards subjected are noticed elsewhere.

Wormwood. (Fr. *Absinthe*. Ger. *Armoise*, Sp. *Ajenje*.)

The popular name of a genus of plants of the *Compositae* order, the best known being the *Artemisia absinthium*, which is common in Great Britain and northern Europe. It is cultivated on account of its tonic properties, and for the volatile oil obtained from its leaves. It is from a species of wormwood that absinthe is manufactured.

Writing Paper.

(See *Paper*.)

Wurrus. (Fr. *Safran batarde*, Ger. *Safflor*, Sp. *Azafran rumi*.)

The glands which cover the fruit of the *Mallotus Philippensis*, a tree found in the East Indies. From the glands a rich orange brown dye is obtained which is much used in India for dyeing silk. It is sometimes known as bastard saffron.

Yak. (Fr., Ger., and Sp., *Yak*.)

A species of ox domesticated in Tibet. It is covered with long silky hair which is used for spinning into ropes and for making coverings for tents. On the shoulders of the animal is a soft fur which can be manufactured into a fine strong cloth. The white bushy tail is employed as a fly-flapper. The trade in these products of the yak is as yet inconsiderable.

Yarn. (Fr. *Fil, Laine filée*, Ger. *Garn*, Sp. *Hilo*.)

The name given to any textile fabric prepared for weaving into cloth. Yarn is produced entirely by machinery, and the perfection of spinning in Great Britain has led to its manufactrue on a gigantic scale, not only for home consumption but also for export. The sizes of yarns vary considerably.

Yeast. (Fr. *Levure*, Ger. *Hefen*, Sp. *Giste*.)

The vegetable growth to which fermentation is due, and of great value in brewing, baking, etc. The yeast obtained from the froth of fermenting malt liquors or beer mash is known as barm. German barm is made by straining off the liquid portion of the yeast through a fine sieve and pouring the residue into cold water in which ti sinks as a sediment. The sediment is afterwards collected and pressed into a dough like mass, a preparation of potato starch being added. The value of the German barm imported annually is about a million sterling.

Yellow Berries. (Fr. *Baies jaunes de nerprun*, Ger. *Gelbbeeren*, Sp. *Piracantas*.)

The unripe fruit of the *Rhamnus infectorious*, a tree of Asia Minor. The berries are shipped exclusively from Smyrna, and are sometimes sold under the name of French and Persian berries. A yellow dye is obtained from them, and this is used in the manufacture of morocco leather. The juice is also mixed with alum, and this forms the sap green of painters.

Yellow Metal. (Fr. *Métal jaune*, Ger. *Gelbesmetall*, Sp. *Metal amarillo*.)

An alloy of copper and zinc. It is much used for sheathing ships' bottoms as the compound is cheaper than copper.

Yellow Ochre. (See *Ochre*.)

Zaffre.

(See *Cobalt*.)

Zebra Wood. (Fr. *Bois de Zèbre*, Ger. *Zebraholz*, Sp. *Madera de cebra*.)

The timber of the *Omphalobium lambestii*, a native of Brazil. The wood is light brown in colour with dark stripes and very scarce. It is occasionally met with in commerce, its use being confined to the manufacture of furniture.

Zedoary. (Fr. *Zédoaire*, Ger. *Zitwer*, Sp. *Zedoaria*.)

The root of ecrtain species of *curcuma*, found in India, China, and the East Indies. The best is obtained from Ceylon. It possesses an aromatic odour and a bitter taste. It is used in a similar manner to ginger.

Zinc. (Fr. *Zinc*, Ger. *Zink*, Sp. *Zinc*.)

One of the most important of metals, hard and malleable. Its colour is bluish-white. Its specific gravity is about 7. Zinc is never found pure in nature, but its ores are fairly plentiful, blende, calamine, and zincite. The main source of the metal is the first

named of these ores, which is a sulphide of zinc and is obtained in large quantities in Germany, Great Britain importing about one-fifth of the whole. In order to obtain zinc the ore is crushed and roasted and afterwards distilled with charcoal in earthenware retorts, the vapour being collected and condensed. The commercial name for metallic zinc is spelter. The metal is largely used in the construction of electric batteries. It is also much employed in preparing galvanized iron, a substance obtained by dipping clean iron into a bath of molten zinc. Galvanized iron is of great value for roofing, the iron being preserved by the presence of the zinc from corroding, owing to exposure to the atmosphere. Oxide of zinc is used as a paint under the name of zinc white, or permanent zinc, and also medicinally in the preparation of certain ointments. The metal is also of value as an alloy, entering largely into the composition of brass and other compounds.

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Digitized with financial assistance from the
Government of Maharashtra
on 02 July, 2018